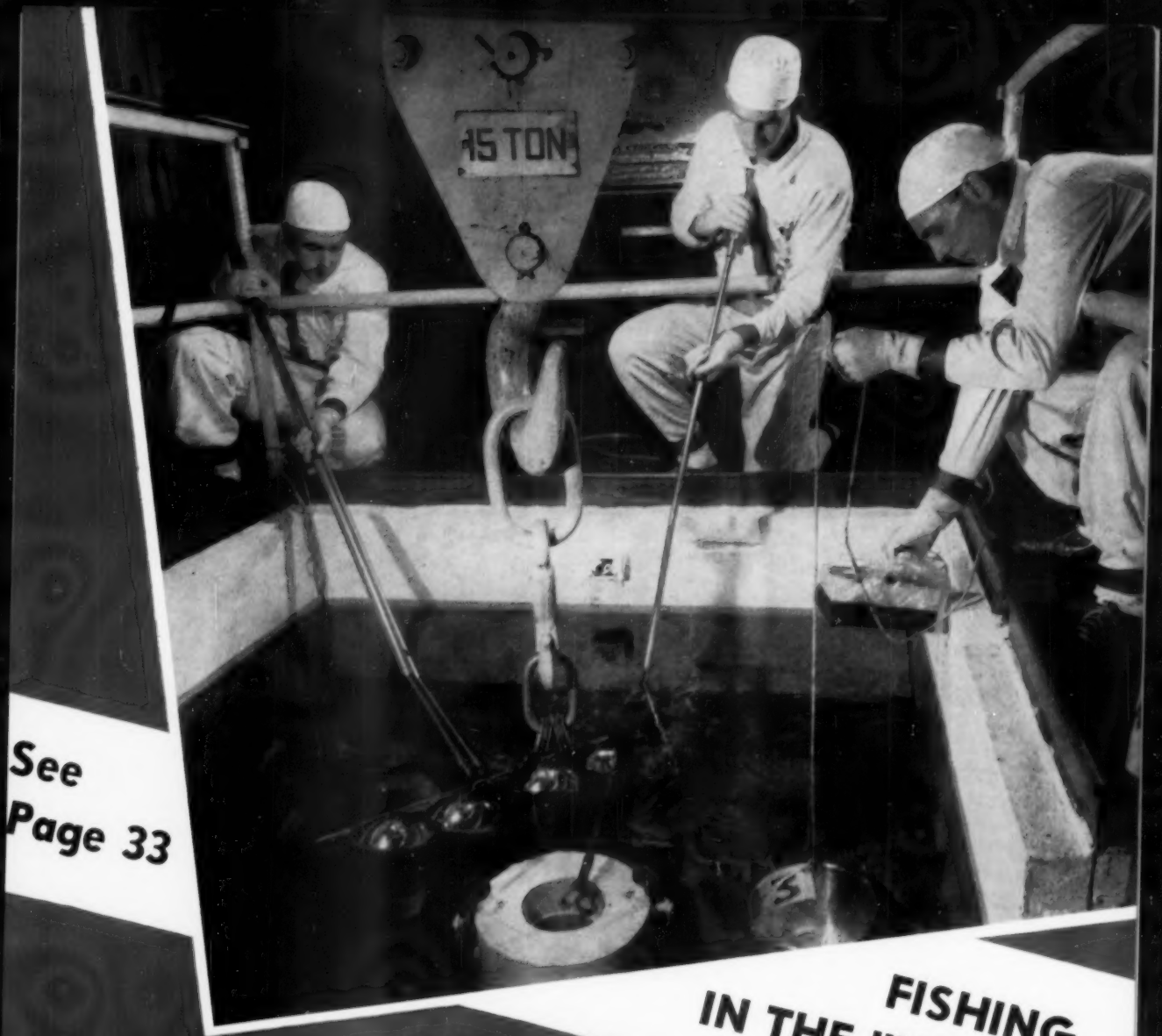

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FISHING IN THE "HOT LAB"

Safety Maintenance

EST. 1901 • AMERICA'S PIONEER MAGAZINE IN ITS FIELD • JULY, 1957 • 50¢

Published By Alfred M. Best Company, Inc.

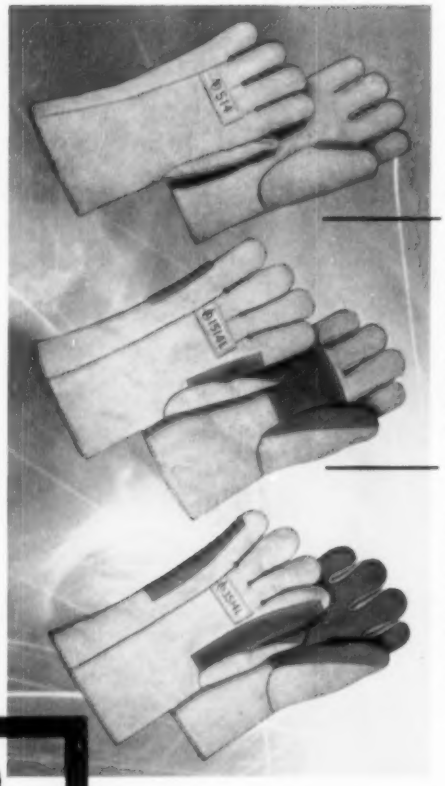
Asbestos Gloves

Thanks to American Optical's
"Operation Seam-Elimination"
More Comfort... Longer Wear with

AO Asbestos Gloves

Because seams have always been the most vulnerable part of a glove, American Optical in our "Operation Seam-Elimination" has done away with as many seams as possible. Result: our asbestos gloves now have only three seams, as compared to as many as eight on most gloves. For example, there's only one seam down the back whereas other gloves have four. There are no seams across the front and back of cuffs — no seams down the sides of the hand. THIS, COMBINED WITH AMERICAN OPTICAL'S QUALITY UNDERWRITER'S GRADE ASBESTOS MEANS LONGER WEAR AND FEWER REPLACEMENTS. More for your money, in other words.

This important pattern development is available on all American Optical asbestos gloves — whether plain, palm leather faced or asbestos reinforced palm — 11", 14" or 23". Lined or unlined.



514 Plain Asbestos Glove

14 inches long (Available 11 inches long as NO. 511; 23 inches long as NO. 523) Note only 3 seams. Lined or Unlined.

1514L Lined Leather Reinforced Asbestos Glove

Reinforced on palm and thumb with chrome-tanned split leather. Specially tanned to resist heat (Available 11 inches long as NO. 1511; 23 inches long as NO. 1523) Lined or Unlined.

3514L Lined Full Leather Reinforced Asbestos Glove

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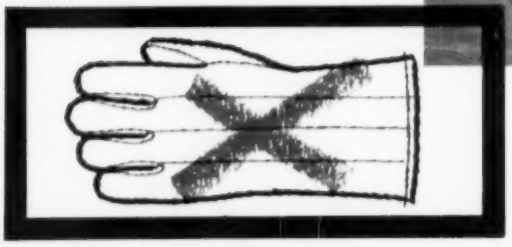

NO SEAMS

Always insist on Trademarked Safety Products. Your nearest AO Safety Products Representative can supply you.

American Optical
COMPANY
SAFETY PRODUCTS DIVISION

SOUTHBRIDGE, MASSACHUSETTS
BRANCHES IN PRINCIPAL CITIES

(For details, use Key # F-1 on card on page 1)

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FREE BULLETINS & CATALOGS

As a convenience to executives, these new publications of manufacturers are offered by the Reader Service Department of SAFETY MAINTENANCE. To obtain copies write in the key numbers on the free-postage card below.

MATERIALS HANDLING

Traveling Cranes 340
American Chain & Cable Co., Inc., Wright Hoist Div. Comprehensive folder describes a hand traveling crane available in capacities of from 3 to 10 tons with spans up to 50 feet. The illustrated folder contains data on construction details, weights, dimensions and other general information.

Hand Winch 341
Multiple Corp. Featured in this 4-page illustrated brochure is a heavy duty hand winch designed to lift, lower and pull. Includes information on specifications, as well as safety and construction features of the equipment.

Casters & Wheels 342
Hamilton Caster & Mfg. Co. 56-page catalog contains illustrations, descriptions and specification data on hundreds of types and sizes of casters for a host of industrial requirements. Included are swivel and rigid casters, steel, rubber and plastic wheels, rubber tires, flanged track wheels, etc.

Woven Wire Slings 343
Cambridge Wire Cloth Co. Illustrated, multi-paged catalog explains a line of woven wire slings for a wide variety of applications. The booklet covers such points as typical applications, specifications, safe rated loads, construction features and prices.

LADDERS & ACCESSORIES

Ladder Safety Device 344
Safety Tower Ladder Co., Inc. 4-page brochure details a ladder safety device to support a climber automatically should he fall from the ladder. The device, intended for all-weather use, can be outfitted with an electric heating cable to prevent ice formation.

8–12 Step Stair Stands 345
Tri-Metal Ladder Co. Described in this illustrated bulletin is a line of castered stair ladders featuring a foot-operated floor lock to prevent rolling when the ladder is in use. Specifications provided list ladder sizes of from 11 to 15 feet.

Steel Stair Stands 346
I. D. Cottermen. Fully-illustrated booklet details a wide variety of stair stands available in heights of from 12 to 117 inches. Dimensions and applications are given, as well as information on accessories such as side rails, workshelves, braking devices, etc.

FIRE PROTECTION

Handling of Flammable Liquids .. 347
Justrite Mfg. Co. Informative catalog features data on the handling of flammable and corrosive liquids. Insurance requirements and various methods of protection for hazardous fluids are also provided.

Fire Extinguishing Systems 348
"Automatic" Sprinkler Corp. of America. 36-page, illustrated booklet explains a wide line of fire extinguishing systems and components, including fixed-temperature, rate-of-temperature-rise, and alarm and control systems. Also provided is a handy chart on the applications and functions of the various systems.

Fire Detection Systems Manual .. 349
Notifier Mfg. Co. Fully-detailed manual offers specific information on a brand of fire alarm systems. Explained at length are the methods of installing, testing and servicing the equipment.

PAINTING

Paint Spray Gun Receiver 350
Protectoseal Co. A paint spray gun receiver to speed-up painting operations is described in this illustrated bulletin. By holding the nozzle tip of the gun immersed in solvent, it prevents paint from hardening at this point.

Paint Spray Booths 351
De Vilbiss Co. A complete line of paint spray booths of every type, size and application is featured in this 35-page catalog. Included are full descriptions and specifications for custom design units and standard units, as well as information necessary for the proper selection of equipment.

MAINTENANCE

Boiler Cleaning System 352
Spencer Turbine Co. 4-page folder describes a stationary vacuum cleaning system for boilers. Components of the system are illustrated, as is a portable boiler cleaning unit which is also featured.

Concrete Floors Topping 353
L. Sonneborn Sons, Inc. This brochure outlines the uses of a non-metallic dry mix for hardening and coloring interior and exterior concrete floor toppings. Contained are color chips of the product which never needs repainting because colors used are an integral part of the finish.

Water Leak Sealer 354
Stonhard Co., Inc. 6-page folder explains how to stop leaks and water seepage in above or below ground masonry. The product is said to stop active leaks almost instantly, without expensive excavation, special tools or delay.

(Continued next page)

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E. I. du Pont de Nemours & Co. 16-page booklet details the properties and applications of fluorinated hydrocarbon solvents in industrial cleaning jobs. Contains data on the comparative performance of the fluorinated compounds, chlorinated solvents and straight hydro-carbon solvents.

MISCELLANEOUS

Laboratory Safety Manual 356

Fisher Scientific Co. Fully-illustrated manual on laboratory safety covers accident prevention, first aid, fire prevention and safety equipment, and includes a section on the handling of radioactive materials. The manual also describes the use of isolation units for microbiological and clinical procedures and concludes with a safety bibliography.

Valve & Flange Covers 357

Neirad Industries, Inc. Illustrated bulletin explains a line of valve and flange covers to fit all types of pipe joints. Designed to protect personnel and equipment, the covers prevent the dangerous leakage of acids and caustics. The covers are available in a leak-indicating and a non-indicating type.

Steel Marking Devices 358

M. E. Cunningham Co. Safety steel stamps, holders, fixtures and other marking devices are included in this 4-page brochure. Also contained in the illustrated folder is a series of charts and related data to aid in ordering the steel stamps.

Self-Adhesive Pipe Markers 359

Printed Cellophane Tape Co. Over 500 self-adhesive vinyl plastic pipe markers carried in stock, which conform to accepted standards, are listed in this 8-page catalog. Cut-out numbers and letters and stock safety slogans are completely illustrated to help in the selection of pipe marking materials.

What's YOUR Problem?

- **Has an accident or fire interrupted production?**
- **Want to know how to prevent it?**
- **Do you need background information on equipment for industrial safety, hygiene, or maintenance?**

As a service to its readers, "Safety Maintenance" will arrange to supply manufacturers literature on the following subjects. Just insert the key number on the Readers Inquiry Card on the preceding page and be sure to fill in your name and address. If you need information on a specific type of product, simply write it in on the Inquiry Card.

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102	Face Shields
103	Lens Cleaning & Anti-Fogging Equipment
104	Sweat Band
105	Hard Hats
106	Respirators & Masks
107	Protective Clothing
108	Women's Protective Clothing
109	Safety Belts
110	Safety Gloves
114	Welding Helmets
115	Welding Curtains
	FIRST AID AND PERSONAL HYGIENE
120	Protective Skin Cream
121	Skin Cleansers
122	Sanitary Drinking Facilities
123	Athlete's Foot Control
124	Salt Tablets
125	Noise Analysis & Control
126	Antiseptic Medication
127	Burn Medication
128	First Aid Kits & Supplies
129	Stretchers & Litters
129A	Pressure Bandages
130	Throat Medication
131	Eye Wash Fountains
132	Hearing Tester
133	Disinfectant—Deodorants
	FIRE PROTECTION
141	Safety Cans
142	Drum Safety Valves
143	Safer Solvents
144	Degreasing Machines
146	Fire Blankets
148	Watchmen's Control Systems
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150	Alarms & Warning Lights
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	MAINTENANCE
160	Anti-Slip Floor & Mats
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162	Floor Cleaning Compounds
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172	Scaffolds
173	Work Platforms
174	Slings
175	Safety Hooks
176A	Fork Truck Fume Muffler
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178	Machine Guards
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179A	Vacuum Sheet Lifters
180	Safety Tools
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Safety Maintenance

formerly "SAFETY ENGINEERING"

Volume 114, Number 1 **July, 1957**

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SAFETY MAINTENANCE is indexed regularly by Engineering Index, Inc., New York

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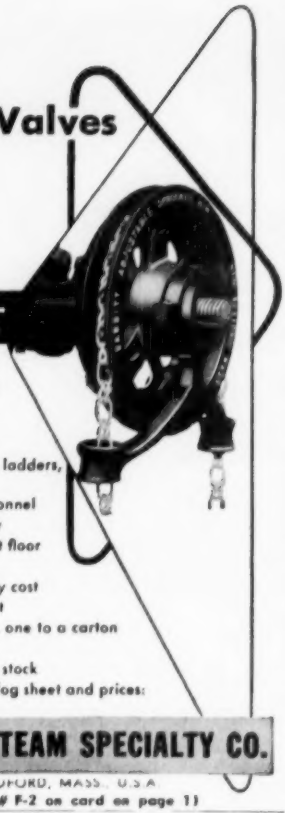

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York Harbor, Me. *September 12–13*

Thirtieth Annual Maine State Safety Conference (Marshall House). Arthur F. Minchin, Secretary, Department of Labor & Industry, State House, Augusta, Me.

Chicago, Ill. *October 10–12*

Eighth Annual National Noise Abatement Symposium (Sherman Hotel). Guy J. Sanders, Chairman, c/o Armour Research Foundation of Illinois Institute of Technology, 10 W. 35th St., Chicago 16, Ill.

Chicago, Ill. *October 14–16*

Second Annual Sanitation Maintenance Show & Conference (Navy Pier). Orkin Exposition Managements, 19 W. 44th St., New York 36, N. Y.

Chicago, Ill. *October 21–25*

Forty-Fifth National Safety Congress & Exposition (Conrad Hilton Hotel). R. L. Forney, Secretary, National Safety Council, 425 N. Michigan Ave., Chicago 11, Ill.

Cleveland, Ohio *November 11–15*

Eighty-Fifth Annual Meeting of the American Public Health Association. Dr. Reginal Atwater, executive director, APHA, 1790 Broadway, New York 19, N. Y.

Chicago, Ill. *January 27–30*

Ninth Annual Plant Maintenance and Engineering Show & Conference (International Amphitheatre). Clapp & Poliak, Inc., Exposition Management, 341 Madison Ave., New York 17, N. Y.

Boston, Mass. *March 17–18*

Thirty-Seventh Annual Massachusetts Safety Conference and Exhibit (Hotel Statler). Bruce Campbell, Manager, Massachusetts Safety Council, 31 State St., Boston 9, Mass.

Ft. Wayne, Ind. *March 18–19*

Northeastern Indiana Safety Conference and Exhibit. Ivan A. Martin, Manager, Safety Council, Chamber of Commerce of Fort Wayne, Ft. Wayne 2, Ind.

New York, N. Y. *April 14–18*

Twenty-Eighth Annual Greater New York Safety Convention and Exposition (Statler Hotel). Greater New York Safety Council, 60 East 42nd St., New York 17, N. Y.

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it's SAFE to say

● THE SAFETY MAN'S STATUS

FROM time to time the true status of the safety director has been a serious bone of contention, giving rise to almost complete frustration. On the one hand, the man responsible for accident prevention and safety maintenance—whether he be known as safety engineer, safety director, manager of the safety department, plant superintendent or any other title—is charged with preventing losses resulting from accidents. In far too many cases, however, his authority is not equated with his grave responsibilities.

Fortunately, this unrealistic attitude on the part of top management is becoming increasingly rare. On the whole, progressive companies today recognize the dollars-and-cents value of the properly trained and equipped accident preventionist who brings to his job a tremendous potential for reducing preventable losses, increasing production and adding to company profits.

Nevertheless, there are isolated cases showing that the status of the safety engineer is viewed in a light so unrealistic as to border on the ridiculous. A specific example is evidenced by the type of "help wanted" advertisement seeking the services of a safety engineer possessing years of experience, a degree from a recognized university, qualifications in handling compensation cases, fluency in public speaking, training in psychology, the ability to walk with kings while keeping the common touch—all at a salary one would hesitate to offer a young graduate on his first job!

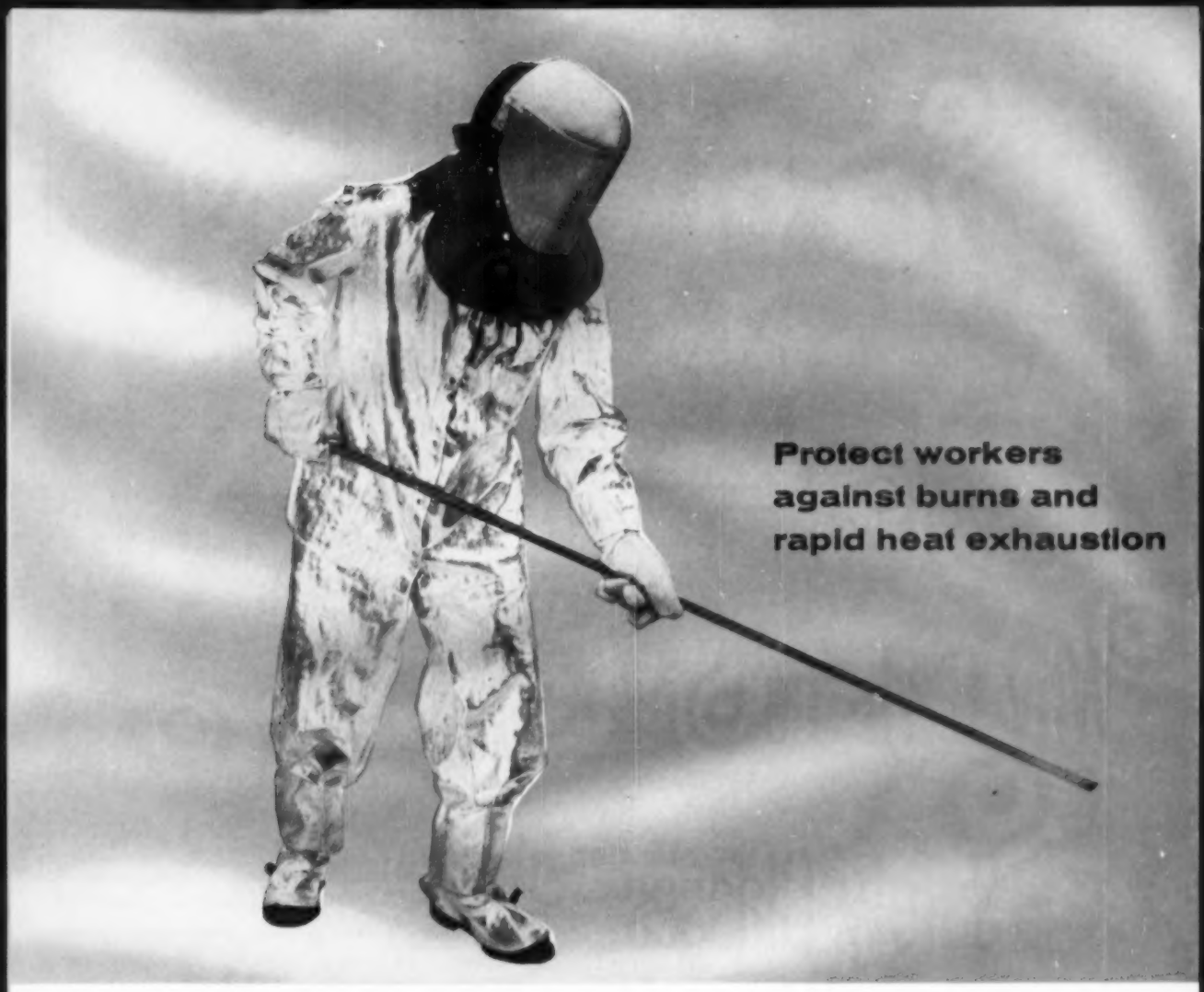
On the other hand, we must recognize that the head of a safety department must be equipped to earn the respect of both management and rank-and-file. When the safety director voices the plaint that he cannot initiate an order for a pair of safety shoes or a dozen eye protectors without crawling to the purchasing department, it may be found that frequently he has only himself to blame!

Under the title, "The Safety Engineer Goes Shopping," there appears elsewhere in this issue an article setting forth the obligation of the safety director to develop his own stature to such a degree that he will be respected by plant management and plant employees. This is particularly vital if he is to be taken seriously at the time of placing an order for safety equipment.

With the advance of industrial operations and the need for scientific equipment designed to cope with new hazards, the safety director cannot afford to "submit" to a purchasing department bent upon buying products of dubious value solely on the basis of bargain-counter or clearance sale prices. With rare exception today, top management does not want that sort of safety(?) man.

In his article, the author, as safety director for a blue-chip smelting and refining company, wisely points up the need for developing the necessary personal background so that each hazard—present and potential—can be studied and evaluated in terms of specific safety equipment requirements.

No one would suggest that the safety department need arrogate to itself all the functions of the purchasing staff. Nevertheless, the safety director is obligated to demonstrate beyond all doubt that he is equipped to evaluate the hazard first and then obtain the required knowledge to combat those hazards, and not merely adequately. By cooperation with the engineering, medical and supervisory departments in the case of large organizations and obtaining outside help for small companies, the head of the safety department soon can demonstrate to the satisfaction of all concerned that he is not simply a walking title fit only for tacking up warning signs!



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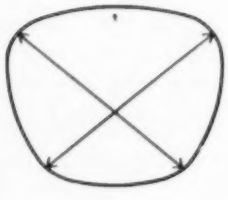

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Give Them a Real Safety Program

Accidents: Their Life and Times

An accident is an unforeseen event that results ordinarily from an unsafe act or an unsafe condition . . . or both. It always interferes with normal processes of living, acting, working. It is almost always evidence of operating inefficiency. Some accidents result in injuries, others do not; but an injury is always the result of an accident. If a basically unsafe act is repeated or an unsafe condition continues to exist, for every minor-injury accident there are ten no-injury accidents (which are potentially lost-time accidents) and for every major-injury accident there are 29 minor-injury accidents (which are potentially major accidents). The fact that for several months a department has had no major accidents, nor even any injuries, does not mean that the department needs no safety program. How many potential injury accidents have taken place but were not recorded? How many unsafe acts have been performed which could suddenly break out in a rash of accidents? The time to catch an accident is before it happens. The way to do it is to develop a safety program which discovers unsafe acts and trains employees to avoid them.

by **ROBERT H. HELMES**
Safety & Training Coordinator
Cincinnati Department of Personnel
Cincinnati, Ohio

The problem of developing a safety program has many complexities, not the least of which is meeting all levels of supervision. It is essential to instill in every employee, regardless of classification, the belief that each man is in some way his own supervisor. Supervision must begin with one's self before it can be applied to others. The purpose of a safety program is to so initiate the employee into the safe method of operation that he becomes individually responsible for his own safe action. Once this has been accomplished, the job of the department has become considerably lessened. The herding instinct, which causes a man to follow closely in the shadow of another, must be limited as it frequently leads to a blind following. **The safety job is not to cause a blind observance of rules, but to encourage a knowledge of the reasons for the rules and by virtue of this to cause the employee to**

Table 1: What Causes Human Failures that Produce Accidents?

1. **Lack of knowledge and skill (or faulty instruction).**
2. **Ignorance, or lack of emotional or mental ability.**
3. **Improper attitude.**
4. **Lack of concentration (possibly home problems worrying the employee).**
5. **Mental sluggishness or fatigue (overwork).**

want to follow them as a means of self-protection and self-preservation. This is known as safety-consciousness. It is the function of the safety department to produce and develop the means of promoting this safety-consciousness among the employees.

In developing safety rules, promoting safety devices, training personnel, the department must never lose sight of the fact that over 80 percent of all accidents are caused by human failures. Human failures that result in accidents are ordinarily caused by one or more factors shown in Table 1. The department must concentrate on these factors in the development of the program. While the machine must never be neglected, it is essential to make an intense effort to eliminate as much of the 80 percent of human failure as possible. The machine can be taken care of by proper selection, constant maintenance and lack of misuse. The latter two of these three points will be assured if the human element is considered in the training and assigning of personnel.

There is no better way to make the employee recognize the need for safety than to allow him to take an active part in the functioning of the departmental safety program. This can be accomplished by the establishment of a departmental safety committee which will be drawn from men in all grades from all phases of departmental operation. By allowing these men to remain on the committee for set periods of three to six months and by then appointing new men to replace them, eventually each man in the department will serve on the departmental safety committee. The functions of the departmental safety committee and the departmental safety coordinator, who acts as secretary of the committee, should be outlined and made available for departmental distribution.

In developing a safety program that considers human failures the department must also realize that it will have basically three types of employees to deal with: (1) **The Obedient** (the safe workers who cooperate because they know that safety is essential to them and to the job); (2) **The Lackadaisical** (who are somewhat indifferent, but obey under pressure; (3) **The Belligerent** (who openly disregard and oppose the need for obedience). Fortunately, 85 percent of the employees fall under the first two headings and will come into line by the adoption of tactful methods. The final 15 percent represent an open challenge to the development of a safety program, and especially to its proper functioning. The department must keep this 15 percent in its mental foreground in planning its program. In considering this type of individual the department must abolish the old idea that authority alone can get cooperation, that machines can be relied upon to surmount human failures, and that it is better to approach a subject defensively than to approach it constructively. A constructive, tactful presentation of material is essential to train men to work safely.

Foreman Is the Key

In the hands of the line supervisor, who maintains a constant contact with the worker, is placed the greatest weight for the success of the program. To the average employee the general supervisor, the superintendent, remains a remote figurehead. The line supervisor, the foreman, is responsible for the quantity and quality of the work and for the time and cost of the job. All of these things are contingent upon the safe operation of the task. The fewer accidents and injuries, the quicker and cheaper the job can be done. In establishing its safety program, the department must provide for adequate indoctrination and training of its foremen in the safe method of operation. It will be impossible for the foreman to check on the safe performance of his subordinates if he does not know the safe way to do the job. And, more important, the foreman cannot properly instruct a worker how to perform a task

(Continued on page 23)

Table 2: What Are Unsafe Acts?

1. **Operation Without Authority. (This may be the driving of a vehicle, operation of a machine, handling volatile or flammable substances, working in lye, entering dangerous areas, etc.)**
2. **Operating at an Unsafe Speed (Operating a machine or a vehicle, or even an individual, at a speed which is too fast or too slow for safe conditions.)**
3. **Unsafe Position or Posture. (Placing one's self in a position which makes one susceptible to accident, such as bending straight from the waist to pick up a heavy object.)**
4. **Unsafe Equipment or Unsafe Usage of Safe Equipment.**
5. **Working on Moving Equipment Unnecessarily.**
6. **Unsafe Loading, Placing or Mixing (Two men trying to unload a thousand pound object without mechanical assistance.)**
7. **Horseplay. (Any kind of nonsensical actions which may occasion an accident.)**
8. **By-Passing Safety Devices.**
9. **Failure to Wear Protective Clothing or Devices.**

The Safety Engineer Goes Shopping

What is his role in the purchase of safety equipment?

by **REX C. BECKSTEAD,** Director
Safety & Technical Employment
American Smelting & Refining Co.
Salt Lake City, Utah

In the purchasing of industrial safety equipment, the most useful thing the safety engineer can do is to develop his own stature to such a degree that he will be respected by plant management and plant employees. In order to develop the necessary background, each hazard within the plant must be studied and evaluated with regard to specific safety equipment requirements. An honest effort must be made to gain the respect of workmen, foremen, and the purchasing department by gathering ideas and giving careful consideration to the respective problems of each.

Before any recommendation in connection with equipment is made, the safety engineer must gather all the facts. Many decisions in purchasing safety equipment are based on preliminary investigation which later proves wrong. A careful set of control tests in connection with each individual piece of safety equipment should be set up by the safety department and used to determine the standards on which equipment will be purchased. With this type of testing program, which we call on-the-job testing, laboratory-controlled tests should also be used. If the plant is small, and laboratory facilities cannot be set up within the company framework, there are several outside agencies from which information can be gathered.

Types of Equipment

In the testing program, it is not enough to test products once and think the job completed. A continued study of all new products relating to safety is important to keep the safety program within the plant making satisfactory progress and to give employees the absolute maximum in personal protection.

Safety equipment is usually broken down into the following categories:

Eye and Face Protection
Respiratory Protection
Foot and Leg Protection
Head Protection
Hand and Arm Protection
Body Protection

In determining the proper equipment for each job, the divisions of protective equipment should be studied separately.

First, let's consider eye protection. First aid records should be carefully reviewed in order to determine just what the cases reported were and how each injury occurred. Careful study should be made of the actual working hazards pertaining to position of workmen, materials, light reflection, intensity and duration of exposure to harmful rays, dust conditions, and other sources of irritation or injury to eyes. With the facts gathered from this type of survey, equipment standards for eye and face protection should be established. The best results will be obtained if

"Safety equipment . . . is purchased strictly on quality and its protective values rather than on price saving."

a safety glass prescription program can be adopted at the same time eye and face protection is recommended.

When considering respiratory protection, the first problem is to determine exactly what the job hazard is. After completion of the hazard survey, the recommendations of the Bureau of Mines and State Health Bureaus will be helpful to the safety engineer in selecting the right protection for each job. In our company, through the cooperation of the hygiene department, we conduct our own company surveys and have set up a testing laboratory for all types of respiratory protective equipment. Standards for this type of protection are made jointly by the medical, hygiene, and safety departments and must be followed by all plants.

Similar studies should be conducted for foot, leg, head, body and hand protection.

In our company, the safety department has made studies of other safety devices such as: ladders, chain and cable slings, safety belts, hand tools, and welding equipment. Standards for this equipment have been prescribed by the engineering departments and are used as a guide for purchasing.

Control of Equipment

After proper testing and study, the safety department should go one step further; that is, they should set up proper controls for issuing and maintaining all types of personal protective equipment, as acceptance by workmen of the equipment supplied will depend largely upon this program.

Our company devotes a great deal of work and study to personal protective devices. Standards have been established and are used by all our units throughout the United States, Canada and Mexico. We call it an "engineered" safety equipment program. This program has resulted in considerable savings for our company. Each new piece of safety equipment is carefully studied and tested for application. If no advantages over present equipment are evident, bulletins are sent to individual units advising that no change will be made in standards established for equipment under test. After careful study by the safety department, it is possible to reduce the amount of inventory required, and it is also possible to plan and order more effectively with less obsolescence of safety equipment.

What About Purchasing?

In any company, safety is everybody's responsibility, especially the foreman's. When establishing standards for equipment, we have found by experience that if the engineering department, the medical department, the hygiene department, the foremen, and the men are consulted and given responsibility in the selection of the equipment to be used, the acceptance of the equipment is much more satisfactory. This particular method of establishing standards also raises the position of the safety engineer in the eyes of his associates.

In most companies, the safety engineer does not do the actual ordering of safety equipment. This is done by the purchasing department. It is a standard practice in our company that the safety department, in cooperation with the department heads and foremen, initiates all orders for safety equipment which are in turn released to the purchasing department for the actual procurement of equipment. Requisitions include brand names, catalog numbers, and quantities desired. Safety equipment is not placed out for bid, as safety equipment is purchased strictly on quality and protective values rather than on price saving. It can be seen that our safety department is not usurping any of the purchasing department's responsibility. We are trying to assist them to help us do a better job by giving them proper information in order to buy the best protection available to protect against the hazards involved within the plant.

From an address presented at the 44th National Safety Congress.

Union's Role in Mine Safety

One of the coal-mining industry's greatest problems—roof-fall accidents—is being combated by special safety programs initiated by the United Mine Workers of America, Charles Ferguson, union safety director, declared at a recent session of the 1957 Coal Convention and Exposition of the American Mining Congress in Cleveland.

Mine workers "are fully cognizant of the fact that safety can only be achieved through the complete cooperation of all parties concerned," Ferguson said, and the Union's safety division "has done everything within its power to bring about closer understanding" among top management, Government organizations and the Union.

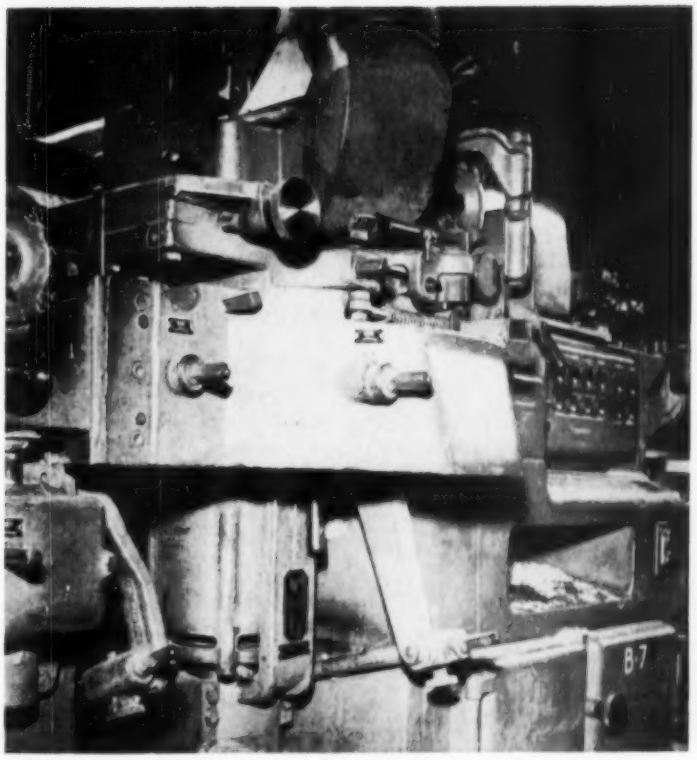
He presented a detailed roof-fall preventive program which he believes is "reaching the man at the face of the coal which in the final analysis is the only answer to more safety in the industry."

The program includes "making every effort to see that men and foremen know the mining law, safety code, and company rules regarding roof-control practices; absolute compliance with such rules must be forthcoming if improvement in the roof-fall record is to be made."

Circular letters are periodically transmitted to Union members, Ferguson said, "to acquaint them with recent developments in mine safety, and better and safer methods of performing work incident to the industry."

He declared that the "cooperation we receive from various segments of the industry and our people is good, although there is room for improvement if we are to have a completely effective safety program."

FOLLOW THE ARROWS



This is a close-up view of an electric molder, showing the squared ends of adjustment screws, with directional arrows and accompanying words.

to Safety and Efficiency

Arrow designations are being found increasingly valuable in different ways in industry. They prove especially helpful to new employees in large plants, when they have to find their way to strategic points promptly, without bothering other workers for directions. A few well-placed arrow signs, particularly at the necessary turns, pointing the way to the plant laboratory, the plant office, or other specific locations, have been found useful.

4 Ways to Use Arrows:

In-Plant Routes

Pipe Flow Indication

One-Way Aisles

Machine Operation

Arrows have been used in different instances to assist plant maintenance men working on different types of pipe lines. Sometimes, such arrows are used in conjunction with color. The color is used for identification preliminarily; the arrows show direction of flow. Thus, water lines may be painted black; steam lines red; air lines green, and other colors used for paint lines around finishing departments and various other pipe lines. Arrows are then used with reasonable frequency along the pipe to indicate direction of flow.

Relatively large plants have found it expedient to set up one or more one-way aisles for plant traffic, and in this connection arrows have been used with particular profit in the interest of safety. Sometimes, these aisles are clearly marked out with yellow paint lines on the floor, to make sure they are kept free and unobstructed within the lines. In any one-way aisle, large yellow arrows may then be placed on the floor in the center of the aisle, pointing out the direction of traffic flow. With one or two good stencils, it is a simple matter to repaint these arrows as need may occur.

Arrows are often used with profit on machines or process equipment to mark the direction in which a screw or valve should be turned. One interesting application of such practice is found where manufacturers of machines arrow-mark their adjustment screws; a relatively-new operator is then in no danger of becoming confused and making an adjustment in the wrong direction.

There are different types of machines where this can be highly important. One application is on woodworking molders, which machine different types of lineal wood stock to specified cross-sections as it is run through the machine. These units have four cutterheads. One operates on the top, one on the bottom, and one on each of the two

(Continued on page 17)

TABLE 2: Six-Month Maintenance Check List for Industrial Trucks

- ☐ 1. Ignition switch; starter switch, starter.
- ☐ 2. Instruments: Oil pressure, ammeter, voltmeter, speedometer, fuel, temperature, tachometer, air pressure, viscometer.
- ☐ 3. Clutch—Gears: Free play, drag, noise; chatter, grab, slip, declutching, shifting.
- ☐ 4. Leaks: Engine, oil, fuel, coolant, exhaust system, crankcase.
- ☐ 5. Gas engine tune-up, see appropriate technical publication. Replace spark plugs, points, and condenser.
- ☐ 6. Generator, regulator: Output, clean and adjust.
- ☐ 7. Cooling system: Radiator, cap hoses, pump, drive belts, leaks.
- ☐ 8. Antifreeze: Protected to degrees.
- ☐ 9. Belts, pulleys, fan: Alinement, tension, wear.
- ☐ 10. Suspension and frame: Springs, torque arms, shock absorbers.
- ☐ 11. Transmission, transfer case, propeller shaft, universal, differential mountings, leaks, end play, vents.
- ☐ 12. Brakes, wheels, wheel bearings, hoses, linkage, fluid, lines, vents, air tanks, side pull, grab, cylinders, hubs, drums, operation.
- ☐ 13. Handbrake: Release, hold, travel.
- ☐ 14. Steering, alinement, linkage, king pins, bushings, caster, camber mountings, balance.
- ☐ 15. Body: Mounting, controls, damage, paint, condition, pintles.
- ☐ 16. Safety and signal devices: Horn, mirrors, wipers, lights, switches, reflectors.
- ☐ 17. Carriage, lift chains, mast assembly.
- ☐ 18. Control mechanism: Lift and tilt levers.
- ☐ 19. Lift and tilt cylinders, pipes, hoses, hydraulic pump: Leaks.
- ☐ 20. Commutator, controller, accelerating resistor, safety and limit switches.
- ☐ 21. Brushes and brush holders, contactor.
- ☐ 22. Power take-off, gear cases.
- ☐ 23. Hoisting and topping winches, sluing mechanism, controls and cables, booms.
- ☐ 24. Hoist slip clutch and safety clutch.
- ☐ 25. Lubricate, vehicle and mounted equipment, oil changed at ..... miles or hours.
- ☐ 26. Tires: Gage pressure, cuts, bruises, abnormal wear, rotate.

by **JOHN BAYUK**, Plant Engineer
Lycoming Division, Avco Mfg. Corp.
Stratford, Conn.

The life line of any industrial plant is the flow of materials through processing from the rough state to the finished product. Modern materials handling methods and the use of mechanized mobile handling equipment (like industrial trucks, conveyors and cranes) are doing a big job in industry to keep materials flowing economically. Any stoppage of the flow of material by equipment breakdowns may cause a department or departments to stop operations. This fact alone stresses that mobile handling equipment must have the same preventive maintenance program as production equipment.

Let's look first at industrial truck maintenance, including the fork truck, platform truck and walkies. In the past decade the fork truck has taken over most of the materials handling burden. It moves and stacks pallet loads of materials about the plant and is either gas or electric driven.

To begin with, we schedule a monthly lubrication, inspection and service for each truck (See Table 1.). Every six months the truck has a major inspection and service in addition to the regular scheduled lubrication, as outlined in Table 2. Manufacturer's lubrication and maintenance recommendations are adhered to. In addition to the above scheduled maintenance, the truck operator fills out a service report every day.

The maintenance dispatcher schedules the monthly inspection with the department operating the truck and they in turn deliver it to the automotive maintenance shop. The shop performs the required lubrication, inspection and services as called for on the printed forms and returns it, properly filled out, to the maintenance dispatcher where it is filed.

Items requiring attention from the operator's daily service report are handled directly by the shop when minor adjustment or repair work has to be done. Any job requiring $50.00 or more for repairs is scheduled through the dispatcher with a work order.

The gas fork truck is similar in many ways to a motor vehicle since

KEEP HANDLING EQUIPMENT ON ITS TOES

it has a chassis, gas engine, clutch, transmission, drive axle, brakes, etc. It differs in having a hydraulic lift cylinder system and is of compact design. The electric driven fork truck substitutes the electric motor, battery and controls for the gas engine, clutch and transmission.

This makes the maintenance work on fork trucks very much the same as on the motor vehicles or the so called over-the-road trucks. We have therefore combined the maintenance of all of these in the automotive maintenance shop. Here the same trades work on both types of vehicles and the same equipment and tools are also used. This effects a saving in manpower, supervision, equipment duplication and plant area.

The shop is located in a separate building with a separate overhead door leading into each stall. The work benches are set on the opposite wall and there is 1 washing stall, 2 grease rack stalls, 4 repair stalls and 1 tire change and repair stall.

The Automotive Maintenance Shop has the equipment shown in Table 3.

(Continued on the next page)

TABLE 1: Monthly Maintenance Check List for Industrial Trucks

- ☐ 1. General visual inspection, leaks.
- ☐ 2. Ignition switch, starter switch, starter.
- ☐ 3. Engine: Starting, noises, idle, vibration, acceleration, power, governor.
- ☐ 4. Instruments: Oil pressure, ammeter, speedometer, fuel, temperature.
- ☐ 5. Hand brake: Braking effect, ratchet, release.
- ☐ 6. Clutch and gears: Free play, drag, chatter, grab, slip, declutching.
- ☐ 7. Service brake: Braking effect, side pull, grab, pedal reserve.
- ☐ 8. Horns, mirrors, windshield wipers, lights, signal devices.
- ☐ 9. Steering: Free play, bind, wander, shimmy, side pull.
- ☐ 10. Carriage, lift chains, mast assembly.
- ☐ 11. Control lever mechanism: Life and tilt.
- ☐ 12. Lift cylinder, tilt cylinder, pipes, hoses, hydraulic pump, leaks.
- ☐ 13. Commutator, controller, accelerating resistor, safety and limit switches.
- ☐ 14. Boom hoisting and topping winches, sluing mechanism, controls and cables.
- ☐ 15. Lubricate vehicle and mounted equipment, gear cases, crankcase, (if oil changed, record miles).
- ☐ 16. Tires: Gage pressure, cuts, bruises, abnormal wear.
- ☐ 17. Cooling system—Anti-freeze: Protected to degrees.

The shop is manned with the following personnel:

1—Foreman
4—Mechanics "A"
3—Mechanics "B"
1—Automotive Electrician

The foreman reports directly to the Supervisor of Mechanical Maintenance. The mechanics "A" do most of the motor checking and repairs with the mechanics "B" doing the assisting work and minor jobs like washing, changing tires and cleaning batteries etc. The automotive electrician checks and repairs the ignition and lighting systems. On the battery driven trucks he checks on motors, controls and battery. He also makes a monthly check of the battery chargers, both the motor-generator and rectifier type. The electrical department does not maintain anything on the electric fork truck, since it is a specialized field and does away with split responsibility between the garage and the electrical department.

The following mobile equipment is maintained with the above facilities:

41—Gas Fork Trucks
3—Electric Fork Trucks
34—Electric Walkie Trucks
23—Gas Platform Runabouts
73—Hand Lift Trucks
12—Rubbish Trailers
87—Chip Carts

In addition to these, we have:

22—Over-the-Road Vehicles
41—Misc. Gas Driven Machines & Pumps

Our gas trucks go through a major overhaul on the average of 3 to 5 years, this depends on the usage, of course. We contract the work out to an authorized factory service and the recent overhaul cost for a 4000 lb. capacity gas fork lift truck was $2500.00. This included the replacement of the following units:

1. Engine Assembly
2. Carburetor
3. Distributor
4. Muffler
5. Water Pump & Hoses
6. Fan Belts
7. Fuel Pump
8. Ring Gear
9. Clutch & Assembly Bearings
10. Brake System
11. Battery
12. Tires & Seat Cushions

The following items were rebuilt:

1. Generator
2. Voltage Regulator
3. Starter
4. Steering Assembly—Front Axle —Transmission
5. Steam Clean & Paint

We have found it better to have the trucks re-built outside, since it took the work load off the shop and no down-time was lost since the overhauls are done by the vendor during the plant two week shutdown.

Other Handling Equipment

Every industrial plant has conveyors of various types. The most popular are the roller conveyer, the belt conveyor and the overhead continuous monorail.

These units are maintained by our maintenance mechanics and millwrights. Since conveyors vary in size, types, construction and capacity it is impossible to set up a standard maintenance procedure. In all cases the manufacturers' recommendations are followed and the inspection cycle is based on an experience factor.

Roller conveyors of the standard type used in areas where dirt does not get into the bearings require about a quarterly inspection and no lubrication if the bearings are packed. Roller conveyors, on the other hand, that are used in foundries require a daily inspection.

Our **belt conveyors** are given a weekly inspection and this includes checking the belt for wear, checking the belt tension and checking the drive motor and its reduction gear and/or the variable drive. This same applies to bucket elevators.

Continuous running **monorails** are checked once a week at which time the trolley wheels are lubricated, track alignment checked as well as the motor drive; reduction gear and/or the variable drive unit.

Production **cranes** having a capacity up to 1 ton are checked and lubricated on a monthly basis. These include jib cranes and bridge cranes. Again manufacturer's specifications are followed.

Large service cranes are given a major inspection every 3 months, this inspection includes checking rail alignment in addition to other mechanical inspections. Lubrication and checking of the hoist cables are done on a monthly basis.

The organizational functions required for mobile handling equipment preventive maintenance are assigned to the Plant Engineering Dept. A Mechanical Engineer reporting directly to the Plant Engineer designs, specifies and selects the required equipment. He also sets up the maintenance schedule

TABLE 3: Maintenance Shop Equipment

1—Hydraulic Lift for Trucks
1—Hydraulic Lift for Fork Trucks
1—Pressure Lube System
1—Engine Analyzer
1—Spark Plug Service Unit
1—6-12 Volt Charger
1—125 psi Air Compressor
1—Paint Spray Unit
1—Voltage Regulator Analyzer
1—75 ton Solid Tire Press
1—Tire Changer
1—Vulcanizer
1—Drill Press
1—Grinder
1—Engine Lathe
1—Valve Re-Facing Machine
1—Hydraulic Brake Bleeder

based on company standards and manufacturer's recommendations.

The actual maintenance is assigned to the Mechanical Maintenance Dept. headed by a General Foreman. Under him are two Foremen, one in charge of the automotive maintenance shop and the other in charge of mechanical maintenance. As mentioned before, the automotive maintenance shop handles all the industrial trucks and the mechanical maintenance department services all the conveyors and cranes.

All this adds up to the fact that mobile handling equipment, being an important aid to production, requires a complete preventive maintenance program on the same basis as machine tools and production equipment.

From an address presented at the 8th Plant Maintenance & Engineering Conference and Show. Picture by courtesy of Market Forge Co.

Follow the Arrows
(from page 13)

edges of lineal material as it passes through the unit.

These four cutterheads all have adjustments for height; also for moving them in or out in making a setup. Ends of the screws are squared, so they can all be operated by the same crank-type wrench. Arrows are used on small plates, fastened to the machine frame adjacent to the screws. The plates carry the word "In" or "Up," as may be applicable to each particular screw. Obviously, turning the screw counterwise to the direction shown by the arrow will make an outward or downward adjustment, as the case may be.

Picture by courtesy of Mattison Machine Works.

Safety Course

Colby College will offer a course in Industrial Safety, August 26–31, 1957. An outstanding faculty in the field of industrial safety will conduct the program. A brochure outlining the course, listing the teaching staff, and supplying other necessary information is available. Fee for the course is $75.00 and covers all charges.

For further information write: William A. Macomber, Director Division of Adult Education and Extension, Colby College, Waterville, Maine.

Safety Maintenance SALUTES

A SAFETY IDEA

Protecting Workers from Acid Splash

The payoff in maximum worker safety against splashing hot acid comes in providing operators with protective equipment and in applying the right material for equipment used in contact with the acid.

Subscribing to this approach is the Pennsylvania Plant of Line Material Co., East Stroudsburg, Pa., which has been using a safe steel to support heavy loads of pole line hardware like this during pickling and galvanizing operations. The safety record so far:—six years of dipping in an open vat of 5–15% sulphuric acid at temperatures up to 200°F without incident due to corrosive wear.

Line Material has been using a specialty steel known as Carpenter Stainless No. 20, a special sulphuric acid resisting analysis, for the pickling rack and hanger. Both are still in use, the rack since 1950 and the hanger since 1948. And both indicate that they will render many more years of safe and dependable service.

A copper-silicon-manganese alloy tried before the stainless steel lasted only two years before corrosion so weakened the parts that they had to be replaced.

Failure of a corroded support would have plunged a load of between 1,000 and 2,000 lbs. into the open tank of acid, splashing and seriously burning the men working there.

Added to the safety contributed by this steel are the resulting high morale of employees who work at the tank, vastly reduced maintenance costs, and uninterrupted production.

Picture by courtesy of Carpenter Steel Co.

THE VALUE OF CONTROL

The value of the tangible benefits which will accrue to the small manufacturer through a system of expendable tool control cannot be overestimated.

1. It is possible to reduce materially expendable tool inventories, by culling out those tools which show no usage over an extended period and by reducing the stock of tools which show only a slight usage. Frequently inventories can be reduced by as much as 50 percent. More important, this reduction can be maintained by the use of statistics which will prevent the repurchase of such tools through habit.

2. Losses of tools issued to production workers, and arguments over reasons for such losses and who was responsible, are practically eliminated.

3. Breakage or damage to tools can be reduced by as much as half, and the time required for issuing and reclaiming of tools is also considerably reduced.

4. The availability of usable tools is increased without additional purchases through more systematic and improved tool maintenance procedures.

5. The fact that a perpetual inventory is being maintained, makes taking the annual inventory a much quicker and easier job.

WHAT HAPPENS TO EXPENDABLE TOOLS?

Control system for incidental tools and equipment aids safety, maintenance, and production efficiency.

by **JACK HAWLEY**, President
Management Control Systems, Inc.
Washington, D. C.

Control and proper care of expendable tools can bring substantial reductions in production costs.

Interestingly enough, it has only been in recent years that this important function has begun to receive proper recognition by manufacturers, large and small alike. The enormous productive demands of World War II provided the greatest single impetus to this recognition by spotlighting the improper care and losses of small tools and the consequent serious drain on production. Even in view of this practical lesson, however, many firms were reluctant to consider the control of expendable tools as anything more than a necessary evil, a "grudged" cost factor in production whose primary purpose was to guard against pilferage and inventory losses other than the usual wear through usage.

More recently, though, an ever-increasing number of manufacturers are installing plans for expendable tool control, not only to guard against "lost-strayed-stolen" tools, but also to provide an important factor in production planning and accounting. These companies have found that expendable tool control systems will protect them against nonconsuming inventory shrinkage and offer additional advantages. The extent of these advantages is shown by the major points of expendable tool control.

What Is an Expendable Tool?

In general an expendable tool may be defined as a consumable, semi-consumable, or nonconsumable production requisite which is charged off, either as a cost on a specific job or as an overhead manufacturing expense. This is the kind of tool being considered as opposed to a depreciable capital asset item.

Consumable tools represent the

bulk of this class and, in addition, the bulk of repetitive procurement. These are such items as drills, cutters, reamers, broaches, taps, dies, and so on, which require frequent sharpening and dressing. **Semi-consumable tools** constitute the bulk of the remaining items in the class, such as wrenches, hammers, pliers, and the like, which are subject to breakage or eventual deterioration and obsolescence. **Non-consumable tools** can generally be repaired through replacement of parts and correct maintenance. Although they will usually represent a much higher dollar value, these gauges, measuring devices, hand power tools, and others, represent the smallest portion of the class.

Control Is a Must

It is no secret to the average small manufacturer that his expendable tools represent a substantial item of expense. As a matter of fact, this cost will frequently equal, if not exceed, the investment in closely-controlled major equipment when the two costs are considered over the life of the major equipment. This single fact alone is sufficient reason for giving special attention to close control of expendable tools when planning for production.

Inventory shrinkage due to loss and pilferage will certainly be minimized by adoption of a comprehensive program for the control of expendable tools, but this saving is only a small part of the potential reward. A much greater saving will be found in terms of the tools themselves. Correct maintenance control and proper preservation procedures will do much to guarantee a longer tool life, avoiding early breakage, deterioration, obsolescence, and accidents.

But the big advantage of the well-planned and correctly operated expendable tool control system is its effect on the production process. Improperly maintained tools can cause delays in production. Not only can time be lost, but valuable, partially completed products can be spoiled as well. Expendable tools, as a production cost factor, are either difficult or impossible to assess if there is no systematic plan to provide such information. All of these undesirable features can be translated directly into lost dollars.

Why is tool room control necessary?
How to store tools safely.
How can tools be maintained in safe condition?

By the same token, the existence of such a control system can turn this loss into a saving. It must, however, incorporate certain fundamental features if it is to provide such a benefit.

In order to obtain the minimum advantages for the small manufacturer, the control of expendable tools requires a place, a person, and a plan. The place will be, of course, the tool room or tool crib. The person will be the crib tool attendant. And the plan will provide for the issue and receipt of expendable tools, their care, and maintenance, inventory records, and accountability.

The tool room or crib must be considered as a production unit inasmuch as it supplies an essential service in the production cycle. As such, its location should be planned carefully rather than decided on a haphazard basis.

The room should be located in a position which will facilitate the easy withdrawal and return of tools by production workers. Another factor affecting the location is the type of manufacturing operation; tool-crib location will vary in job shops as opposed to strictly production shops. But regardless of these considerations, it is not (generally) economically sound to permit each department to run its own tool service and control operation, although there may be a few minor advantages in such a system. There should be a single point for service and control.

An undesirable building arrangement might well be responsible for

Table A: How to Store Tools

Shanked tools, for the most part, are best protected when they are arranged upright in baseboards, which serve to separate them individually. If they are to be stored in trays or on shelves, separate niches should be provided. Niches should be lined with some "soft" material, such as wood or cork, in order to further protect the tool.

The cutting edges of such tools as drills, reamers, broaches, and the like, should be protected from contact with each other to prevent dulling. The same thing is true of all hard surfaces where contact with such a surface can also damage the cutting edges of these tools.

Milling cutters, grinding wheels, and other similar tools, which have a central bore are best stored on horizontal or vertical pegs. The pegs should have an outside diameter which is just slightly less than the shaft bore of the tools.

One of the simplest methods for the storage of sensitive instruments, such as gauges, micrometers, and the like, is to keep them in the original boxes in which they were packed. The same type of protection can be provided through an arrangement of special trays, containing recesses cut to fit the outline of the instrument.

operations conducted on more than a single floor or in adjacent buildings. The operation may be a job or short-run production shop which calls for frequent use of tools for short periods. Whatever the reason, the temptation to set up separate points for the control of expendable tools should be resisted. If necessary, one or more sub-cribs may be set up but they should all be controlled and serviced by the main tool crib.

The mere existence of a centralized service and control location will automatically avoid many of the costly abuses which lead to the loss of tools. For example, small tools which are left on machines, benches, or in improvised tool racks on the production floor may frequently fall to the floor, become mixed with chips, turnings, and other debris, and be swept up and consigned to the scrap heap. These same tools, when they are exposed to dirt, dust, oil, humidity, acid fumes and many other corroding elements, can easily become unsatisfactory and even harmful to production operations.

When tools remain in the possession of production employees, even though they may be stored in boxes, cans, or drawers, they are still subject to severe damage to cutting edges, alignment, measuring points, gauging, and over-all accuracy. Regardless of the efficiency of the capital equipment employed, an attempt to use such tools in production is likely to increase operating costs through damaging a partially completed product or causing its rejection in quality inspection.

Once the location of the tool crib has been selected, the next point for consideration will be its internal arrangement and the facilities for handling and storing the tools.

Expendable Tool Storage

The tool crib should be kept immaculately clean and frequently painted. This will add indirectly to tool life, since it will have an important psychological effect on workers who use the tools. A poorly run or sloppy tool crib will always be a constant source of expense and annoyance. It is not difficult to avoid this unfortunate situation if certain basic principles and practices are given proper attention.

First of all, tool storage racks, regardless of their weight, should be provided with casters. This is an important point in good housekeeping but there is an additional advantage in rapid tool issue in cases where the demand for a type of tool is subject to change—a change which might be temporary or even semi-permanent. In view of this requirement, steel shelving on casters will provide the best storage of expendable tools.

The method of storing the individual tools within the tool storage racks is most important because it has a direct bearing on the effectiveness of the effort to protect and preserve the tools. See Table A.

In addition to the specific methods of storage for expendable tools with sensitive features, there are several general practices which can add to the effectiveness of the tool crib's internal arrangement.

Less sensitive tools may be grouped in trays or on shelves according to type, kind, or size. Tools which are applicable to a single tool equipment or a group of such equipments should be arranged separately from general purpose tools. The bins or storage racks of the tools which are most in demand, and therefore most frequently used, should be placed in the most practical position adjacent to the issue point.

Tool Crib Attendant

In the past, too many manufacturers have left the control and maintenance of expendable tools up to the men who actually use them, the production workers themselves. This is a particularly great temptation for the smaller manufacturer with his very real concern over costs. Because his labor force is usually not large and he knows most, if not all, of his men, he is apt to feel that the establishment of a system for the control of expendable tools is unnecessary and a waste of money. This approach can offer only one advantage—simplicity. But as time goes by it will become more and more expensive, because it is a makeshift method in which the production worker is expected to do a good job with something in which he has little interest and for which he may lack the necessary qualifications and equipment. When assigned to a production worker, care and maintenance of tools will always be delayed until the last possible moment or not be done at all. As a result the proper tool may not be available, or may be dull or improperly sharpened. The obvious result is inventory shrinkage and wasted production time.

Assign Responsibility

In order to achieve the maximum benefits from a system of control of expendable tools, it is necessary to assign responsibility for the function to a single, well-qualified individual. In smaller shops, it might not be necessary for the tool attendant to have an assistant. Further, he might have other duties as well as his responsibility for the tool crib. Whatever the case, this important function must be assigned to an individual who is fully experienced in the methods and procedures for the control and maintenance of small tools.

Thus the ideal tool-crib attendant should be a toolmaker or tool maintenance man who is thoroughly familiar with all types and kinds of tools, their use and application, and the approved techniques for their maintenance. In many cases, he will be able to offer assistance in the selection of the proper tool to do a particular job by virtue of his experience.

The well-qualified tool attendant will also be able to lend advice and counsel on procurement problems which involve expendable tools. He will understand the tools with which he works and will thus be in a position to take the best possible care of them, not only in terms of regular maintenance but from the standpoint of repairs as well. Such an individual will fill the second requirement of the place-person-plan triangle.

Since many of the tool attendant's duties involve maintenance, the subject of expendable tool maintenance will provide a good lead into the third and last requirement —a plan for the control of expendable tools. This subject will be covered in the next issue of SAFETY MAINTENANCE.

Material by courtesy of the Small Business Administration.

Falls Aren't Funny!

by **LEE MILLS**
The Cincinnati Transit Co.
Cincinnati, Ohio

A man slipped on a banana peel, twisted, caught himself, slipped again, and finally went down in a most complicated fall.

As his wits cleared, he noticed a circle of people about him. "What do these idlers want?" he snapped angrily to a friend.

"Oh, they're not idlers," explained the other. "One's a doctor who wants to look you over; one's a lawyer who will handle your case for you; and the other man is a comic film producer who would like to sign you up."

Even though falls are used extensively in theatrical productions to create funny situations, the sad fact remains that falls aren't funny. Falls account for more accidental deaths and injuries than any other cause with the exception of traffic accidents. Seventy people in the United States die every day from injuries received in falls. When it comes to falls, there is a very, very thin line between the ridiculous and the tragic. Perhaps, this is the reason that the average person dismisses the great dangers involved in falls so lightly.

Today in the United States twice as many persons are killed away from work as are killed on

· Industry can keep employees from falling for an accident off the job ·

the job. Industry has done a marvelous job in persuading, inspiring, and educating the employee to work more safely year by year.

Now industry has come to the startling realization that injuries off the job are subjecting them to a serious drainage of needed and skilled manpower. The resulting interruptions to their well-planned work schedules are costing untold millions of dollars which can well mean the difference between profit and loss to an organization.

There is much more to this off-the-job accident picture than industry's having to face the economic facts of life. There is also the humanitarian side. No person likes to see another person hurt, crippled or killed because of an accident. That is an overwhelming reason why top management officials of alert, progressive companies are lending more and more support, both moral and financial, to off-the-job safety programs.

We must educate adults to provide the precautions necessary to prevent falls to the young and the elderly who cannot take care of themselves. Another important thing to remember about accidents is that they permanently cripple three to four times as many children as they kill.

We will have to indoctrinate our adult population with the philosophy that "falls aren't funny" but deadly. To save themselves from falls, they must be told of the little things which set the stage for disastrous tumbles. They must learn to look where they are going and go where they look.

Sometime ago, a fellow saw an acquaintance of his on crutches and solicitously inquired, "How on earth did you break your leg?"

"Well, you see, it was this way," was the answer, "I threw a cigarette in an open manhole and stepped on it."

A few years ago the Greater Cincinnati Safety Council and the Hospital Care Corporation jointly conducted a gigantic survey of personal non-fatal injury cases treated at ten cooperating hospitals. This survey revealed that of 15,730 accident cases treated, 8,750 or 54.5 percent resulted from accidents in the home.

Almost two-thirds of the home accidents occurred inside the house. The remainder was in the yard, garden, sidewalk and the driveway.

The three most dangerous spots in the home were:

Steps
Kitchen
Bedroom

Thirty-five percent of the home injuries resulted from falls. Falls from roofs, ladders, porches and other high levels were frequent. The predominant factors were slipping, stumbling and overbalancing.

Falls on steps, and in bedroom, bathroom and basement were about evenly divided between males and females. Males, however, had more falls in the kitchen.

STAIRWAYS are one of the most commonly used areas in the home and one of the most dangerous unless proper safeguards have been taken. Eleven out of every hundred deaths in the home occurred going up and down stairs.

What can you do to prevent falls on stairs?

- **To be safe, your stairways should have proper lighting with switches at both the foot and head of stairs.**
- **Do not make your stairways temporary closets. Keep them clear of brooms, sweepers, clothing, books and papers.**
- **Always have a good solid hand rail and use it at all times going up or down. When you carry a baby, keep one hand free so you can hold onto the rail.**
- **Scatter rugs at top or foot of stairs are welcome mats to accidents. If you feel they must be used, they should be firmly anchored.**
- **Check regularly for loose treads, worn carpets, or highly polished wood surfaces.**
- **Where there are young children, gates should be placed at both top and bottom of the steps to keep both children and playthings off the stairs.**
- **Get help going up and down steps when you have a heavy load or one so large it blocks your vision.**

THE BEDROOM, surprising as it may seem, accounts for nearly 25 percent of the accidental deaths occurring in the home. One of the reasons for this is that many ill, aged or infirm persons spend most of their time in the bedroom.

You have all heard of people getting hurt falling out of bed. But whoever heard of someone almost getting killed by falling into bed. However, there are many such cases on record. In an apartment house in Chicago, a young woman, preparing to retire, slipped on a rug at her bedside and plunged headlong into bed. Her head struck the upright slats of the headboard and became wedged between them. Her screams brought help which arrived just as she was losing consciousness.

To prevent falls in the bedroom:

- **There should be bars on low silled windows and screens on windows should be fastened securely.**
- **Keep the sides of the crib up to save the baby from a bad tumble and the mother from unnecessary worry.**
- **Keep drawers closed. Open drawers are a bumping and tripping hazard.**
- **Furniture should be arranged so there is a clear path from door to bed with light switches at both places. A proper lighting arrangement will prevent tripping over and bumping into things while groping around in the dark.**

The proper precautions can eliminate bathroom falls.

- **Non-skid bathmats both inside and outside the tub should be provided for sure footing.**
- **Soap on the bottom of the tub or floor is dangerous. Keep the soap in the soap dish.**
- **Grab rails or handles should be installed at the bathtub.**

To prevent falls from ladders:

- **Safety check your ladder for broken or loose parts before use.**
- **Place all types of ladders so that the feet rest on a firm surface, which is not slippery.**
- **When leaning a straight ladder against a wall, make sure that it rests away from the wall at a distance approximately one-quarter of the height of the ladder.**
- **Be sure top of ladder is square and secure. A rotted eave or a**

faulty railing of an upper porch can mean a plunge to a serious injury or death.

- Always climb a ladder slowly and steadily. Any shifting movement or sway is a sign that the ladder is placed improperly.
- Step ladders should be opened fully so that the side braces latch.
- Do not overreach. Do not climb too high. Always face the ladder.

Falls not only cause serious injury or death but they are very costly accidents for the victims and their families. A little extra caution and knowledge on the part of each person can do much toward the reduction of accidental falls.

It is up to us, who are in industrial safety work, to fire a tremendous barrage of educational material which will produce a profound impact upon our employees and their families so they will know what steps to take to protect themselves from falls. This can be done by letters to the homes, bulletins, leaflets and booklets, posters, films and safety talks.

Let's inform the public that the safety they have learned on the job is a precious thing which they can take home with them. Armed with the proper knowledge they certainly won't fall for an accident. Instead of people falling, let's make the accident rates tumble instead.

From an address presented at the 26th All-Ohio Safety Congress.

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A Real Safety Program

(from page 10)

efficiently if he does not instruct him in the safest possible way of functioning.

Every department must realize that each accident involves both a physical and human element. The human element can often be termed the "supervisory" element. The physical element is the actual event which causes the injury, such as the slipping of a ladder, which causes an employee to fall and be injured. The human or supervisory element is the underlying cause which creates the accident opportunity. This could be any act prior to the accident, such as failing to secure a ladder properly, failing to use available ladder shoes, and so on. Safety development is mainly a matter of combating or instilling habits. The human element, failure, or habit which occasions an accident develops through a process of repetitions. **The first time an employee performs an unsafe act, it is not a habit. But by the fifth or sixth time it has become a habit which will be very difficult to break.** It behooves the department to stop the act before it becomes a habit. This is a method of avoiding the accident or preventing the accident before it happens. This is a much better, safer, cheaper, and more effective method than trying to stop the recurrence of an accident after it has happened.

Follow-up is the most important phase of the accident prevention program. The best laid plans in the world will fail if there is no provision made for constant following through on all the ramifications of the program. There are many employees in the ranks who have developed unsafe habits over a period of years. These habits are

difficult to break. There is only one sure method. It is a repetitive process in which the employee is corrected tactfully each time he is found violating a safety rule. Once he knows that he will be corrected each time he makes such a violation, he will come around to the safe way. The follow-up consists of the constant checking to prevent accidents by stopping unsafe practices, and in giving recurrent instruction in safe practices.

The objective of any safety program is to bring the employee to the maximum of efficiency as quickly as possible. Making the employee efficient engenders safe operation, which will minimize accidents, increase production, and decrease cost. At the same time it will increase the morale of the employees who know that they are operating under safe conditions and that they have been adequately trained in the performance of safe acts.

In order to be able to prevent unsafe habits or acts it is necessary to be able to recognize them. National safety studies have broken unsafe acts down into nine categories, as shown in Table 2.

Once the unsafe act has been recognized the problem arises of preventing it. The prevention is a positive process which must remain in effective motion. It can be divided into definite steps, as shown in Table 3.

In stopping an unsafe act and in training the man in the safe way to perform it, it is of the utmost importance that the foreman exercise tact. No man likes to be told that he's doing something wrong. It is essential that the foreman use an approach that will not cause resentment. There's no future in driving an employee into the belligerent 15 percent. Use a tactful approach such as, "Maybe I didn't explain this thing to you properly. Look! here's the proper way to do it."

Safety Incentives

Once the safety program has been put into effect, it is essential for the department to provide some incentive to keep the employees saftey-minded. Merely convincing the employee that safety is essential to his own well-being is not sufficient. The employee should have an incentive, a goal toward which he can aim. The department can provide this incentive by initiating safety contests between its various branches or divisions, which should be rewarded by the placing of a trophy or flag or some other token in the area of the branch which maintains the best safety record. Other contests can be held between employees. Buttons can be awarded to men with long safety records, or scrolls or personal commendations before other employees can be made. Various other means can be adopted to give the employee something to aim for.

The safety department must never lose sight of the fact that safety does not end on the job. It should carry out campaigns promoting safety in the home. See that an employee's family gets a copy of safety bulletins. See that they know about any safety contests held in the department. Run safety contests for the employees' children. Convince the family that the department furnishes safety precautions for all dangerous jobs at work, and that the family should be equally as cautious about jobs performed at home.

The development of an effective safety plan and the assurance of its being carried out and followed will soon show physical evidence of its advantages in the morale and production record of the department.

Table 3: How to Prevent Unsafe Acts

1. STOP THE ACT. Don't delay; stop the unsafe act the first time that you see it; and stop it every time that you see it; never let it ride for a couple of days. Keep stopping it every time it occurs until you note that it is no longer evident. Even then, check from time to time to make certain it is not recurring.

2. INVESTIGATE. Find out why the unsafe act is being performed. Ask the man who is acting unsafely why he is doing so.

3. INSTRUCT THE EMPLOYEE or remind him of the proper procedure which has previously been shown him.

4. TRAIN THE MAN FOR THE JOB. Never assign a man to a new job until he has been properly trained in the performance of that job. Improper training will allow him to develop his own unsafe habits and to pick up all the unsafe habits of his fellow-workers.

5. ESTABLISH PROPER JOB DISCIPLINE. This should follow naturally as the result of establishing a procedure of safe and effective training and maintenance.

Colonel Gilbert E. Teal

N. Y. University Honors Colonel Teal

New York University, during recent formal ceremonies, presented its annual Founders Day Award to Colonel Gilbert E. Teal, Deputy Commander of the Air Research and Development Command's Air Force Personnel and Training Research Center (AFPTRC).

Colonel Teal who holds a Bachelor of Science degree in civil engineering received the following degrees from New York University; Master of Arts Degree in Education, Master of Administrative Engineering, Doctor of Engineering Science, and Ph.D. in Education.

Colonel Teal, having achieved a place in the highest bracket of scholastic preferment recognized by New York University while

earning his degrees, was selected as one of this year's recipients of the University's special honor conferred on students who have distinguished themselves among their fellow students through consistent evidence of outstanding scholarship. He is an active member of the American Society of Safety Engineers and also of Veterans of Safety.

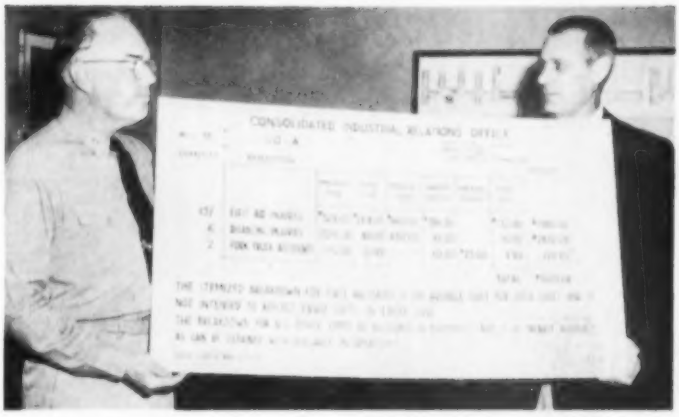
State's Safety Laws For Heavy Construction

By action of the New York State Board of Standards and Appeals, workers on heavy construction projects—road construction, bridge building, earth-moving operations, large-scale excavations, trenching, pipe-laying—came under the State's worker-safety regulations governing the construction and demolition industries on July 1, Industrial Commissioner Isador Lubin, head of the New York State Department of Labor, has announced.

Formerly the safety regulations, Industrial Code Rule #23, had been applied only to the erection and demolition of buildings and other above-ground structures. The Board of Standards and Appeals decided to extend the code rule to heavy construction workers after a series of state-wide public hearings.

"One of the main reasons for the necessity to enlarge the area of enforcement of the regulations was to prevent repetition of a tragedy such as occurred in Brooklyn," Commissioner Lubin said. An accident occurred in a trench excavation for a sewer under construction. An employee was crushed to death when shoring collapsed. "Our construction safety consultants inspected the excavation, but could not issue orders, since that type of work was not covered by our code rule. In this particular case the contractor even refused to heed recommendations made by our personnel."

In addition to extending the code to these construction workers, a 19-man advisory committee has been appointed to revise the construction and demolition code in order to meet new technological advances.



Rear Admiral John W. Crumpacker receives a bill, representing the cost of accidents and injuries to employees at the Aviation Supply Office and Naval Aviation Supply Depot during the first quarter of this year, from Safety Specialist John J. Dougherty.

Big Bill for Accidents

Rear Admiral John W. Crumpacker, Navy Supply Corps, Commanding Officer of the Aviation Supply Office and Naval Aviation Supply Depot, Philadelphia, recently received a bill for $5020.28 from John J. Dougherty, the Naval Depot's Safety Program Specialist.

The bill represented the cost of accidents and injuries occurring during the first quarter of 1957. In presenting the bill, Dougherty pointed out that the equivalent total would purchase 32 typewriters, 72 desks or 502,028 pencils.

Admiral Crumpacker was quite disturbed when he received the bill and issued the following statement:

"Injuries and accidents are a complete waste—waste of time and waste of resources, human and material. If measuring the human suffering in these 140 accidents and their effect on the over-all mission of the Navy is difficult, that suffering and that effect are no less real and merit the concern of each one of us.

"On the other hand, a loss of over $5000.00 in one quarter is something tangible. In these days when every Government agency is attempting to eliminate unnecessary spending, we cannot tolerate waste of any kind.

"I have instructed the Safety Division to prepare quarterly bills for each supervisor in whose jurisdiction an accident or injury occurs. I expect all personnel, military and civilian, to take necessary precautions to reduce this waste to a minimum."

Standards Engineers Society Meeting

Standardization—Economy Through Application is the theme of the Sixth Annual Meeting of the Standards Engineers Society, being held at the Hotel Commodore, New York, September 23, 24, and 25, 1957.

How standards can be applied by management to solve many problems of purchasing and production for greater economy and more profits will be emphasized in sessions featuring various phases of standards application. These will include materials, electrical components, mechanical components, and electronic circuitry, among others. Sources of information on standards will be considered, and problems of company organization for best use of standards will be presented with possible solutions. The relatively new problem of "reliability" will be the subject of one of the sessions.

President of the Standards Engineers Society is Herbert G. Arlt, Bell Telephone Laboratories, Murray Hill, N. J. The 12 sections of the Society are located in New York, Philadelphia, Washington, Hartford, Boston, Binghamton, Los Angeles, Hamilton-Toronto (Ontario), Pittsburgh, Chicago, Detroit, Montreal (Quebec).

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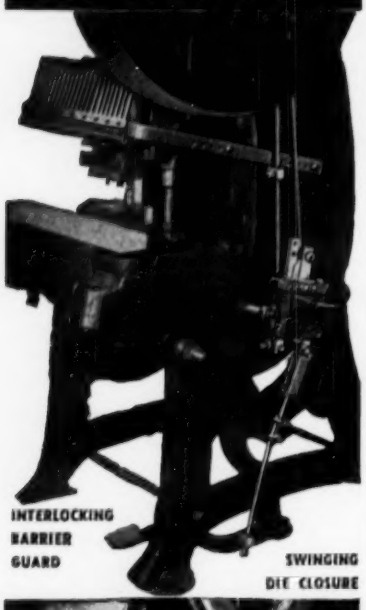

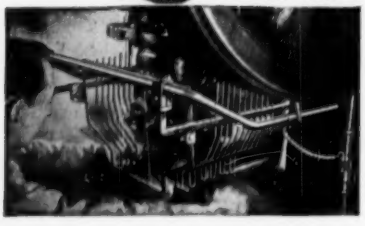

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Rigging Manual

"Handbook of Rigging," by W. E. Rossnagel, a practical manual of rigging practices and pointers for construction and industrial work, has just been published in a fully revised and up-to-date Second Edition.

The book is planned to show how to handle every step in any rigging operation—from rigging a swinging scaffold and painting a steel stack, to operating a hoist or using a hydraulic jack.

It includes simple formulas used in calculating the strength of hoisting tackle, beams and posts, etc. It gives such varied helps as data on safe loads on wire rope and chain, effect of defects on the strength of timbers, reference codes, laws, and standards relating to rigging, hoist signals, safety practice and first aid, and many other facts and data useful in all aspects of planning and handling safe, effective rigging.

To bring the book abreast of advances in materials and methods, this edition contains such information as methods of loading heavy equipment on motor trucks and other transportation apparatus, methods of attaching sling to loads which are to be rotated onto their sides or completely inverted, new devices such as the Flemish eye splices for wire rope slings, new safety belt for use when climbing ladders on tall chimneys, new types of scaffolds, the "overland train" for transporting heavy loads through deserts, swamps, and jungles, etc.

W. E. Rossnagel is Safety Engineer with Consolidated Edison Company of New York, where he has been for 30 years. His practical background for writing this book comes from 15 years of that experience, in construction work where safe and efficient rigging was of prime importance. Published at $6.50, the volume is available from McGraw-Hill's Book Information Service, 327 West 41st Street, New York 36, N. Y.

Furniture Factory Fires

Sparks resulting either from cutting and welding or electrical defects are the cause of nearly half of all furniture factory fires. This finding is reported in a study of furniture factory fires published by the National Fire Protection Association. The NFPA's Fire Record Bulletin FR 56–3 contains illustrations and cites specific cases of significant fires in the past three years in wood and metal furniture factories.

It also tabulates known causes and starting places of fires as well as factors contributing to the extent of damage to 150 specific furniture factory fires studied.

The report excerpts pertinent NFPA technical fire safety standards on such subjects as provisions for conveyor openings in fire walls, sprinkler protection for spray finishing areas, automatic protection for dip tanks, and precautions regarding electrical equipment in spray booths.

Copies of this special occupancy fire record on furniture factories are available from the NFPA Publications Department, 60 Batterymarch Street, Boston. Price is 50 cents per copy.

Corrosion Problems

Dr. Mars G. Fontana, chairman of the department of metallurgical engineering at Ohio State University, is the author of a new book, "Corrosion: A Compilation," published by Hollenback Press, Columbus, O.

The book is a compilation of the monthly columns on Corrosion written during the past ten years for "Industrial and Engineering Chemistry." The articles are grouped into seven chapters (1) Nature and Extent, (2) Eight Forms of Corrosion, (3) Eight Methods for Combatting Corrosion, (4) Corrosion Testing and Evaluation, (5) Materials, (6) Environments, and (7) High Temperature Oxidation.

Practically all metals and alloys and some non-metallics used for corrosion applications are covered. The book describes methods and detailed procedures for laboratory and plant testing, and shows corrosion as a function of temperature and concentration of acids through iso-corrosion charts.

Causes and cures for many actual plant problems and mechanisms of corrosion are described in readily understandable terms.

The book is designed as an aid to plant men and as a reference text, or textbook, for courses in corrosion. It is used by the author as a text.

Dr. Fontana is a graduate of the University of Michigan where he received a bachelor's degree in chemical engineering and a masters and Ph.D. in metallurgical engineering. From 1934 to 1945 he was metallurgical engineer and supervisor in the engineering department of Du Pont, Wilmington, Del., and in 1945 joined the faculty of Ohio State. The book can be ordered from Dr. Fontana, 2086 Elgin Rd., Columbus 12, Ohio at $5.95.

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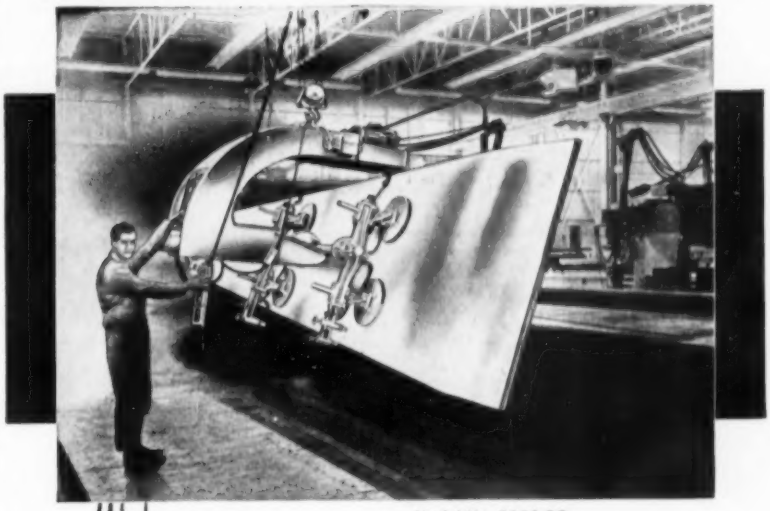

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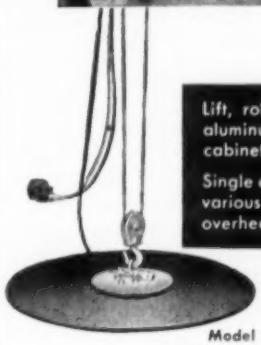

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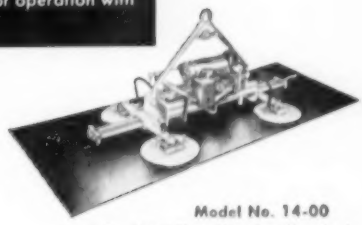

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Building Exits Code

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This has been proved by experience many times over. And such experience is the basis for one of this country's most important life safety codes, the latest edition of which has been published by the National Fire Protection Association.

The provisions of the code are based upon studies of fires in which there has been a large death toll. Psychological as well as physical factors have been considered—fire experience has demonstrated that many of the fire tragedies of history cannot be completely explained by physical factors alone.

In the current edition, an effort has been made to minimize construction requirements which are not essential to exit safety, and which may be included in city building codes.

The Building Exits Code, NFPA No. 101, is available in pamphlet form from the NFPA, 60 Batterymarch St., Boston, at $1.00.

Edited by HENRY M. GROSMAN
Counselor at Law, Newark, N. J.

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EYE INJURY—No Causal Connection with Employment

An electrician was properly denied compensation for the loss of vision in his right eye. He failed to prove a causal connection between dirt getting in his eyes on a windy day, while at work laying conduit pipes, and a detached retina which resulted in the loss of vision. A fair summary of all the medical evidence is that claimant had a diseased eye condition of long standing and the degenerative processes in the eye were the cause of the detached retina, rather than any trauma in the form of a blow to the head or eye. Affirmed.

Smith vs. Industrial Commission of Arizona; Arizona Supreme Court, No. 6231. March 26, 1957.

ELECTRIC SHOCK—Contributory Negligence

In this common-law action for damages for personal injuries arising out of a casualty which occurred while plaintiff was in the employ of defendant as an electrician, the plaintiff rejected the Workmen's Compensation Act. Judgment should have been rendered for defendant employer since the contributory negligence of the plaintiff was the cause of the casualty. In doing some electrical work at a substation of the employer, with another employee, the plaintiff in an attempt to tighten a cable on which they were working got up on a ladder and stepped off it onto a new transformer, feeling reasonably certain that he had room to stand on the transformer. He knew that by getting up on the transformer he would be 3–4 feet away from the 13,200 volt primary line. So far as evidence of his direct contact with the electricity is concerned, the proof showed that plaintiff sustained a severe second degree burn on his right arm from about 8 inches above the elbow to 8 inches below, the third degree burns on the soles of both feet, indicating that the electricity entered his body on the arm near the right shoulder and the points of exit were the soles of his feet. Plaintiff seeks to be exculpated from the charge of contributory negligence as a matter of law on the theory that he was an inexperienced servant, that he was without experience in working as an electrician in an energized substation. There is no substance to this claim. The record indicates that plaintiff was both qualified (by education) and experienced (he worked for defendant five years) and had knowledge about the effects of high voltages. The work to be done was not dangerous if done properly. Plaintiff, in assuming the position which he did, knew or ought to have known it was an exceedingly hazardous thing to do and it was an act defendant had no reason to expect of him. There is no escape from the conclusion that this constituted want of due care on his part for his own safety which formed the direct, producing and efficient cause of the casualty and hence bars recovery herein. Judgment should have been directed for defendant. Reversed.

Coleman vs. North Kansas City Electric Company; Missouri Supreme Court, Division Number Two. No. 44673. January 14, 1957.

ASSAULT—Arising Out of Employment

A building company employee was properly awarded compensation for a broken arm sustained when he was assaulted by a fellow employee. The evidence, though conflicting, showed that the fellow employee was the aggressor. The employer contended that the injury sustained did not arise out of or in the course of employment. The court ruled that the evidence showed that the employee sustained his injury while performing duties required of him by his employment. The injury sustained resulted from a risk reasonably incident to his employment and therefore arose out of and in the course of employment. Award sustained.

Thompson Building Co. vs. Midgette; North Carolina Supreme Court, No. 241. March 20, 1957.

industrial hygiene

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Sanitation Awards

Top honors in the national competition for the Samuel J. Crumbine Awards, sponsored by the Public Health Committee of the Paper Cup and Container Institute, were presented to the San Jose City and San Diego County Departments of Public Health at the annual meeting of the Western Branch of the American Public Health Association.

First place for "outstanding achievement in the development of a program of eating and drinking sanitation" was awarded to the San Jose unit.

Top honors for "outstanding achievement in the development of a comprehensive program of environmental sanitation" went to the San Diego Department.

San Jose's winning program drew special attention because of its effort to give the food handler new status in his own eyes and at the same time give the restaurants observing correct sanitation procedures added prestige in the eyes of the buying public. By cooperating with restaurant owners and the workers' union, the department obtained high voluntary enrollments in special courses, which cover (1) personal hygiene, (2) disease transmission, (3) correct dishwashing methods, and (4) food protection.

The San Diego County department was cited by the jury for carrying out an unusually well-rounded program over a large territory and continuing its pioneering activities.

Typical of the departmental projects were:

1. Pioneer work in developing standards of construction and operation for mobile vehicles vending foods to industrial workers so that this new kind of food service, through the cooperative effort of industry and other public groups, was made as safe as that in any public restaurant.
2. Establishment of fact-finding studies to determine air pollution in the county in general and in areas within the county, every sanitarian making twice-daily reports on conditions within his district.
3. Successful solution of county-wide difficulties with septic tanks through study of the problem and passage of an ordinance requiring health department tests and approval of installations.
4. Development of measures to handle such nuisances as mosquitoes and dissemination of necessary information to the public about the measures through newspapers, radio and television.
5. Maintenance of a vigorous communications program to keep the public posted on changing sanitation problems and developments.

The Public Health Committee of the Paper Cup and Container Institute has announced the opening of the 1958 Fourth Annual Samuel J. Crumbine Award Competition for programs conducted in 1957. Requirements are the same as in previous years, and no department that has won an award may compete for the same award again. Previous winners may, however, try for the award which they have not won.

Entry blanks may be obtained from Crumbine Awards Jury, Room 1025, 250 Park Avenue, New York 17, New York. All entries must be submitted by March 1, 1958.

Industrial Hygiene Problems

The Industrial Hygiene Foundation has announced the publication of the "Transactions of the 21st Annual Meeting," which was held at the Mellon Institute in Pittsburgh last fall. The 288-page book includes the technical papers and discussions presented at the conference. The subjects are divided into the general categories of: Management, Medical, Legal, Engineering, Chemical-Toxicological, and Joint Technical Conferences.

Copies of the illustrated book are available at $5.00 from: Industrial Hygiene Foundation of America, Inc., Mellon Institute, 4400 Fifth Ave., Pittsburgh 13, Pa.

how to measure noise exposures

by **KENNETH C. STEWART**
Research Associate
Department of Occupational Health
University of Pittsburgh

NOISE CONTROL SERIES
other articles August & September

Just what do we mean by "exposure," whether it be to noise or to some other noxious element in the environment? Exposure has biological connotations and the very use of the word implies that man is the recipient of some adverse environmental agent. In safety and industrial hygiene we have come to accept the fact that environmental exposures are tolerable or safe if they do not induce biologic change. For example, there is the exposure to silica dust. We say the exposure, (that is, the effect on the lungs of man) is safe provided certain dust count levels are below some maximum allowable concentration. How did we determine that the exposure to silica dust is safe if the concentration lies below this M A C number? We know because we have had long experience with dust measurement and have been able to correlate these measurements with the observed response of the lung.

Through these correlating studies, we learned something about the sizes of dust particles and what sizes were important in causing biological damage in man. We learned something about the toxicity of the dust itself, where it is deposited, and the mechanism of action within the lung. Consider the years of experience required before we advanced to the point where we now stand in our knowledge of the silicosis hazard; and even now, in spite of the fact that we have a maximum allowable concentration for silica dust, it is still very difficult to determine exactly what we mean by man's dust **exposure** when sampling a dusty atmosphere.

When we take a sample with any environmental apparatus, we assume that the sample we take is representative of man's long-term exposure to the particular contaminant. We know, however, that we have to make adjustments in some way for peak and average conditions. In other words, when a dust sample is taken there is no certainty of the long-term exposure. Therefore, even though there is considerable knowledge accumulated by the best workers in the field, we still do not have precise methods whereby a given sample of an environment represents the real exposure to man over a long period of time.

Noise Exposure

The noise problem is considerably younger than the dust problem, and we do not have broad experience to draw on to help us evaluate noise hazards; but just as the dust problem required certain physical measurements which were consistent with lung reaction to dust, so we must make certain physical measures of noise and these measurements must be consistent with expected physiological reaction of the ear. This presupposes that we know something of the physiological response of the ear to sound, and this implies that we account for frequencies in noise and the intensity of noise because the response of the ear itself is at least partially in terms of these two factors. The question is how to measure these variables practically and what method will provide a realistic assessment of the noise hazard.

We know the ear responds to an enormous range of sound intensity, therefore, as a first consideration, our sampling instrument must also respond to an enormous range of sound intensity. Sound measurements are expressed in terms of a logarithmic notation where the unit is the decibel. Small decibel numbers in the range of 20–30 DB mean the sound is extremely faint; large decibel numbers in the range of 105–120 DB mean that the sound is so intense that the ear experiences pain.

In addition to the response to intensity, the ear recognizes that some frequencies in noise are more damaging than others of the same intensity. Because of this, it is clear that any measurement of noise intended to be biologically significant should include a knowledge of the manner in which the intensity is distributed throughout the hearing spectrum.

Practically, the noise spectrum is divided into octave bands and instruments have been designed to provide

There must be greater correlation between the measurement of specific noises and their effects on human beings before we can have a realistic basis for predicting hearing hazards.

decibel readings in each band. Thus, for a given noise the octave band instrument tells us where the noise energy is concentrated along the audible spectrum. Further, the band width chosen appears to provide sufficiently detailed information concerning energy concentration and at the same time provides fairly steady readings for ease of recording. Given such an instrument, the need is to employ it in environmental measurements in such a way that realistic exposure data are obtained.

Let's return for a brief moment to the subject of peak and average dust exposure. Similarly, the noise analyzer will provide valid readings for correlating purposes only if the noise is steady, for then precise energy calculations can be made. If the noise is unsteady, we have the analogous case of peak and average dust exposures where defining relations are so complex that biologically significant readings are not obtained. For the case of reasonably steady noise, exposures can be determined if certain criteria are met.

Specifically, the noise measured must be that to which the man is actually exposed. This means that near and far field conditions are important to consider, for in nearly all factory situations the close-in noise is several DB higher than noise measured a few feet from the man. Since exposure measurements must reflect the experience of the ear, care must be exercised to determine noise levels at the ear itself. Movement of the worker with respect to the sound source will not materially affect the degree of exposure, provided near and far field levels have been demonstrated

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to be essentially the same (that is, within about five DB). However, if the difference between near and far field levels is large (that is, 10 DB or so), the mobile worker is, in effect, exposed to a non-steady noise. In this case biologically significant exposure data are extremely difficult to obtain.

Non-Industrial Exposures

Another complicating factor is that of off-the-job exposure. It is conceivable that some of these exposures might be even more severe than occupational exposure, itself. For instance, consider the enthusiastic hunter or amateur cabinet maker. These individuals will experience considerable added noise exposure which never gets into the in-plant exposure data.

It is evident that the measurement of noise exposure under unsteady conditions is most difficult, even in the rather simple case of exposure change just due to man's activity. Consider the far greater problem of measuring exposure when the noise itself is a non-steady function. The difficulties are magnified by the new fact that the octave instrument no longer provides a steady reading. The meter does not follow intensity variations accurately, and even if it did there is no method which presently tells us how to interpret such readings as far as hearing hazard is concerned. An instrument which provides additional information in the cases just discussed is the peak and averaging type instrument. It should be emphasized, however, that such instruments alone will not tell you what constitutes noise hazard, for presently, there is no validation for these instruments. Before any instrument or technique will serve as a hazard measurement, readings of the physical environment must be compared to the hearing of man after exposure to the specific noise as measured.

Industrial Research

The dust problem is now old enough to have given us long-term observations of lung pathology which have been correlated with dust measurements. Similarly, we must use noise measuring instruments in such a way that the exposure is described physically; and concurrent with this, hearing studies must be conducted to provide the biologic change in man. The measurement of noise **exposure** will never be accomplished until there is recognition of this fact and research directed toward this end. We are fortunate, indeed, that some industries are not only aware of this but are actively participating in reasearch, so that in the foreseeable future physical measurements of noise will, in fact, have exposure meaning in some instances. The general description of noise hazard, however, under the wide variety of situations found in industry will probably require years of study. We are only beginning to attack this new problem, but through continued cooperation of industry noise will join the growing list of controlled occupational hazards.

From an address presented at the 44th National Safety Congress. Picture by courtesy of Mine Safety Appliances Co.

MEET THE "HOT LAB" TECHNICIAN

The "Atomic Age" has produced a new kind of handy man—the "hot lab" technician.

He handles highly radioactive materials and his job is one that requires a great deal of skill and know-how. The term "technician" is somewhat of a misnomer for he may be a scientist with a doctor's degree, an engineer, or a skilled worker.

This new atomic occupation is practiced by 40 men in a laboratory designed especially for study of materials that give off invisible and penetrating rays. The laboratory is located at the Atomic Energy Commission's Bettis plant at Pittsburgh, Pa., which is operated by the Westinghouse Electric Corporation.

Ray C. Westphal, supervisor of operations in the hot lab, said the facility has recently been expanded so the lab now may safely handle specimens 1000 times more radioactive than previously tested here.

"Working with radioactive samples is a remote handling job," Mr. Westphal said. "The men cannot touch the test pieces, and usually they have to operate testing equipment with remote controls or mechanical hands. At the same time, the man in the lab must be radiation conscious."

Mr. Westphal, a physicist who received his nuclear training at the University of Illinois, said the key factors in a hot lab operation are rigid procedures for handling radioactive materials safely and skilled technical people who have been trained to be radiation conscious.

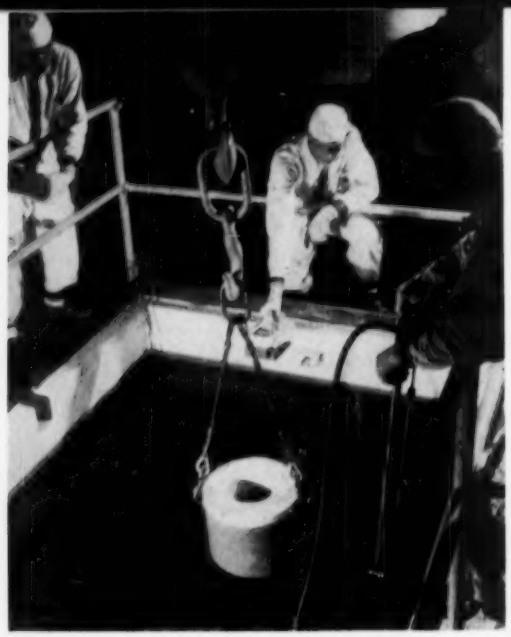
"Our procedures for handling these materials," the Westinghouse scientist said, "are based on one simple rule: everything in the lab is considered to be radioactive until it is proven safe by a radiation meter. That's why our people carry radiation detecting instruments and wear protective clothing—head coverings, special coveralls, and plastic shoe coverings—whenever they go into an area that might contain radioactivity."

It takes about six months to train a man to work in the hot lab. It takes that long for him to become adept with the mechanical hands that perform the experiments behind three-foot concrete walls. And, it takes a man that long to get used to the procedures for protecting himself against radiation.

"You can't see radioactivity; you can't smell it and you can't taste it," Mr. Westphal said. "The only indication of its presence comes from the swing of the needle on the radiation meter."

Safety in Numbers

As a safety measure, the men in the hot lab always work in pairs when radioactive materials are being handled. One man always carries the radiation meter. In addition, every man in the lab wears a film badge and a dosimeter (a personal radiation monitoring device) as long as he is in the lab. Industrial



STORAGE TANK: **Working underwater with radiated materials is one of the techniques employed to protect personnel from radiation. A lead shielding cask to transport "hot" samples is being raised in the water tank, as shown here and in the picture on the cover of this issue. The technician at left is operating the 15-ton crane which raises or lowers the cask. The technician in the center monitors the invisible radioactivity with a portable meter; and the technician at right holds the controls for a set of four sealed beam headlights used to illuminate the bottom of the tank when samples are being transferred from the cask to stainless steel buckets. Each of the men is wearing protective clothing, including coveralls, two pairs of gloves and specially treated shoes. They also have safety belts around their waists to prevent them from falling.**

VACUUM CLEANER: **Imagine the housewife trying to vacuum-clean her house by remote control! But that is just what this technician is doing. By using mechanical "hands," he conrols an electric vacuum cleaner to pick up radioactive dust that has accumulated in the "cell."**

hygiene specialists keep a close check on any radiation a worker might receive.

Working conditions in a hot lab are complicated by the protecting construction of the facility. The Bettis Hot Lab, one of the busiest in the country, is a typical example. Three new test cells have been constructed to permit testing samples that emit up to 1,000,000 curies of radiation—that's the same activity a person would get from a block of radium that weighed 2500 pounds (usually radium is used in quantities that are a thousandth of one pound).

Test Cells

The new test cells are made of a dense concrete that measures three feet thick. The one door into each cell is fabricated from heavy steel plate, 22 inches thick; and each door weighs over 12 tons. A technician or engineer can watch an experiment in the cell through a glass window 34 inches thick.

Inside the cells, radioactive samples undergo numerous tests including those for hardness, impact strength, tensile strength and density. After results have been compiled, the irradiated materials are shielded in special lead and concrete containers, provided they are no longer useful for testing purposes, and disposed of according to AEC regulations.

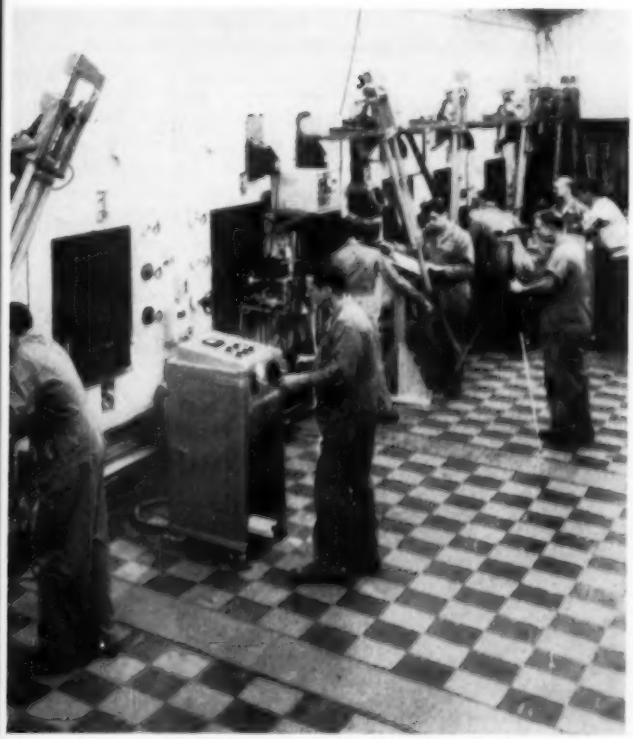
The lab operators have to be able to perform most common scientific and engineering tests—and do them behind a three-foot wall. That's why working in the hot lab is developing a new kind of technical handy man.

Pictures by courtesy of Westinghouse Electric Corp.

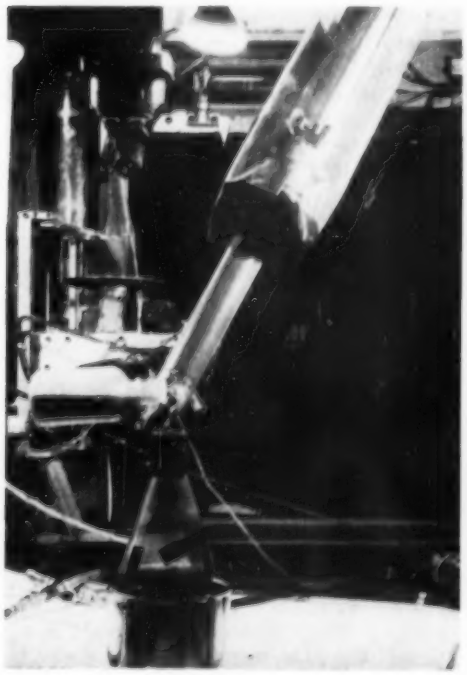
CONTROL ROOM: **Safely protected from radiation by three-foot thick, high-density concrete walls, these technicians in the control room of the Bettis "Hot Lab" handle radioactive samples by means of mechanically operated "hands"**

FROM THE OUTSIDE IN: Impact tests to determine the amount of energy absorbed in breaking a sample of radioactive material are conducted by this remote control machine. The technician manipulates the "mechanical hands" from outside the "cell." Impact readings are taken from the semicircular dial at left of the impact machine.

FROM THE INSIDE OUT: Skillful manipulation is required as the technician, barely visible through the cell's window, operates the controls of a mechanical "hand" which pours nitric acid into a beaker inside the cell. Nitric acid is used to clean scale corrosion from radioactive samples prior to tests.



and "arms." The samples, located inside "cells," each 6 feet by 11 feet, are viewed through 3-foot thick windows which are made of layers of radiation-stabilized plate glass. Periscopes and telescopes are used to inspect the radioactive specimens at closer range with safety.



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Four Safety Films Released by Disney

Four new one-reel safety films have been released to the 16mm field by Walt Disney Productions. Much beloved Donald Duck and the old pro, Jiminy Cricket, star in these new additions to the rapidly expanding list of popular safety cartoons produced by Walt Disney.

Donald Duck stars in "How to Have an Accident In the Home" and demonstrates how most home mishaps are "carefully premeditated."

Jiminy Cricket assumes the role of teacher and master of ceremonies in "I'm No Fool As a Pedestrian," "I'm No Fool In Water" and "I'm No Fool Having Fun."

All of the new titles are in color by Technicolor. Each offers laugh provoking entertainment and more important each teaches safety as well.

Films are available for rental from Disney distributors throughout the country. Business firms and educational libraries can also obtain prints under a lease/purchase plan. Full information may be secured from 16mm Film Division, Walt Disney Productions, Burbank, California.

Wire Rope Safety

Wire rope, a key item of equipment in strip or open-pit mining of coal and other minerals, requires careful handling and proper maintenance of related working parts such as sheaves and drums if its maximum working life is to be safely utilized, delegates attending the 1957 Coal Convention and Exposition of the American Mining Congress were told.

B. N. Carlson, chief wire rope engineer of U. S. Steel Corp.'s American Steel and Wire Division, Cleveland, said at a convention session that the proper maintenance of wire rope should start even before the rope is placed in service "because excellent equipment maintenance can be nullified by careless handling and storing." He explained that, if through rough handling, "some of the wires in a strand or some of the strands are displaced, the built-in balance of the rope structure will be disturbed. The resultant overstressing, which is generally accompanied by concentrated heavy abrasion of the wires at the damaged spot, can have no other end point than early failure."

Carlson also said that wear of sheaves and their flanges are common causes of abnormal rope wear, causing not only external abrasion but internal wear as well.

He recommended that "the men responsible for inspection and replacement be thoroughly acquainted with the locations at which wirebreaks are most apt to occur." Examination should be made for internal as well as external wirebreaks, Carlson concluded, and data obtained from these examinations should be used as a basis for determining the safe rope life which can be expected as well as the most effective inspection procedure for the equipment involved.

Achievements and Awards

Department of the Army Safety Certificates for compiling from 10,000 to 200,000 manhours without a lost time accident were presented recently to four departments and 37 branches and staff offices at the U. S. Army Corps of Engineers' Research and Development Laboratories, Fort Belvoir, Virginia.

The four departments and two of the branches received certificates issued by the Corps of Engineers. This type award is given only to units with over 200,000 manhours without a lost time accident. Receiving this award were Civil Engineering Department, 394,385 manhours; Electrical Engineering Department, 900,924 manhours; Military Engineering Department, 254,981 manhours; Technical Service Department, 1,239,646 manhours; Shops Branch, 425,854 manhours; and Transportation Branch, which showed 76 percent improvement in accident experience during the last half of 1956.

The other awards, issued by Fort Belvoir, went to staff offices and branches with over 10,000 consecutive manhours without an accident of any type up until 31 December 1956.

Receiving this award were Purchasing and Contracting; Comptroller; Safety; Technical Liaison; and Legal Offices; Technical Reference and Analysis; Office Service; Engineering; Standardization; Specifications and Reports; Packaging Development; Climatic; Materials; Map Compilation; Map Reproduction; Aerial Photo; Mechanical Equipment; Special Equipment; Engine; Night Vision Equipment; Electric Power; Far Infrared; Mine Detection; Physics Research; Special Projects; Camouflage; Mine Warfare; Obstacles; Demolitions and Emplacements; Sanitary Engineering; Structural Design; Floating Equipment Design; Petroleum Equipment; Fire Fighting; Buildings; and Bridge and Marine Test Branch.

NEW PRODUCT DEVELOPMENTS

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The exclusive Miller-dee, with stop tip, has wide horizontal bars to prevent snap roll-out. Cat. No. 7003

Miller, first to develop a new Safety Snap eliminating roll-outs and hang-ups, now standard equipment on all Miller straps.

Scientifically designed Miller Adjusta-climber with U channel shank has the exclusive curved gaff principle to protect against cut-outs and insure greater comfort.

Backing the lineman to the limit, Miller's new 99 Bak-Saver adds comfort to safety and support. Write for catalog on complete line.

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Miller EQUIPMENT COMPANY, INC. • FRANKLIN, PA.

IN CANADA: SAFETY SUPPLY CO., TORONTO

(For details, use Key # F-27 on card on page 1)

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DUSTY,
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YOU NEED . . .
FOG-PROOF,
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GOGGLES
. . . for paint spray, gases, dusts, fumes, smoke. They hug your face so securely that hazardous outside elements cannot reach your eyes. Fog is removed from lenses by an easy nod or shake of the head. The few drops of water placed on the inner wall of the lens do the trick. Yes, they can be worn with any respirator. Sample, $2.00 postpaid.
H. S. COVER, P.O. Box 2508
South Bend 14, Indiana
"Respirators for Industry since 1894"

(For details, use Key # F-15 on card on page 1)

The U. S. Atomic Energy Commission has awarded the Bettis atomic power division of Westinghouse Electric Corporation two safety awards for more than one million consecutive man-hours without lost time accidents.

One safety award is for the time interval from September 28, 1954 to March 21, 1955 when 2,122,860 man-hours were worked without lost time; the other represents 1,877,196 man-hours without lost time from July 26, 1956 to October 2, 1956.

The Bettis plant's safety record has also been recognized by the National Safety Council. Safety awards have been received by Bettis from this organization every year since 1950, one year after its establishment. Mr. Edgar C. Barnes, manager, industrial hygiene, directs the Bettis safety program.

• • •

Life Savers Awards from Liberty Mutual Insurance Company were recently presented to two employees at the Great Lakes Carbon Corporation coke plant, St. Louis, Missouri.

Delbert E. Heine, of Affton, and James L. Minor were cited for rescuing on October 30, 1956 fellow employee Donald W. Kunz from a storage tank where he had been overcome by benzol fumes. During the rescue operation Mr. Heine and Mr. Minor were partially overcome by the fumes. The award presentations were made by Mr. Michael J. Treps of Liberty Mutual's St. Louis office.

• • •

Safety has become a habit—a good habit—at Esso Standard Oil Company's refinery in Everett, Mass. Employees of the plant are starting afresh now that a disabling injury has ended their most recent safety accomplishment—870 consecutive days with no time lost on account of accidents. During that time they worked nearly two and a half million safe manhours.

But this was only the third best safety record set by the Everett Refinery of Esso Standard. The best was a period of 1,008 safe days established during World War II.

• • •

The nation's top safety honor in the trucking industry has been presented to the Dan Dugan Oil Transport Company of Sioux Falls, S. D. The award, known as "the President's Cup," was presented to Dan Dugan, president of the company, at the Spring Conference of the ATA Council of Safety Supervisors in the Baker Hotel, Dallas. Awarded annually by Trailmobile Inc., the award goes to the trucking company adjudged to have the best record in accident frequency and highway safety promotion.

A leading firm in its field of oil

transport and one of the top mileage-loggers among all trucking outfits, the company has won 42 national safety awards of various kinds in eight years.

Another high spot of the ATA safety meeting was a report by Kenneth H. Tuggle of the Interstate Commerce Commission that there was a 14 percent decline in fatal accidents involving trucks last year, despite increases generally in accidents and in motor vehicle mileage.

• • •

The Rocky Mountain Arsenal award of Merit has been presented to the Industrial Property Division and the Storage and Service Branch of the Arsenal for more than 200,000 man hours of work without a disabling injury.

• • •

Accident and fire prevention methods, with progress reports, were subjects of discussion by Celanese Corporation of America safety engineers from plants in eight states, Mexico and Canada. At the meeting, Glenn G. Fleming, Corporate Director of Safety and Plant Protection, noted that the company-wide accident frequency rate for disabling injuries during 1956 was 1.9 per million man-hours worked, compared to a national average of 6.96 during 1955. The percentage figure is based on approximately 26 million man-hours worked. Mr. Fleming said that during the past ten years, Celanese plants and laboratories have won more than 125 national awards for accident prevention.

• • •

The First United States Army has been awarded the Department of Army Award of Merit for Safety for the calendar year 1956. First Army has won the award four times since the award was established in 1950.

The award is given to Armies, technical services, installations and overseas commands which show significant reductions in accident rates. First Army with headquarters at Governors Island, N. Y., also received an "excellent" rating for the direct interest and participation in the safety program by its commander and staff, and for the quality of educational, promotional and training efforts directed towards greater safety.

As compared with 1954–1955 averages, Army aircraft accident rates decreased more than 74%; motor vehicle accidents dropped 17½%; and civilian injuries decreased nearly 9% for First Army personnel.

Net percentage reduction in all accident rates in the eight-state First Army area was 18% for 1956, as compared with 13% for 1955's average reduction over the two years preceding.

It's easy to Fight the Noise Hazard with the Scott Portable Sound Meter

The H. H. Scott Sound Level Meter is an unusually compact instrument, designed for portability, accuracy and ease of operation. It weighs only 2 pounds 7 ounces, and you can hold and operate it with one hand. Non-technically trained personnel can learn to operate it in five minutes.

Important features of the H. H. Scott 410-C Sound Level Meter:

- Flashlight-size and battery power make it ideal for sound survey use.
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(For details, use Key # P-16 on card on page 1)

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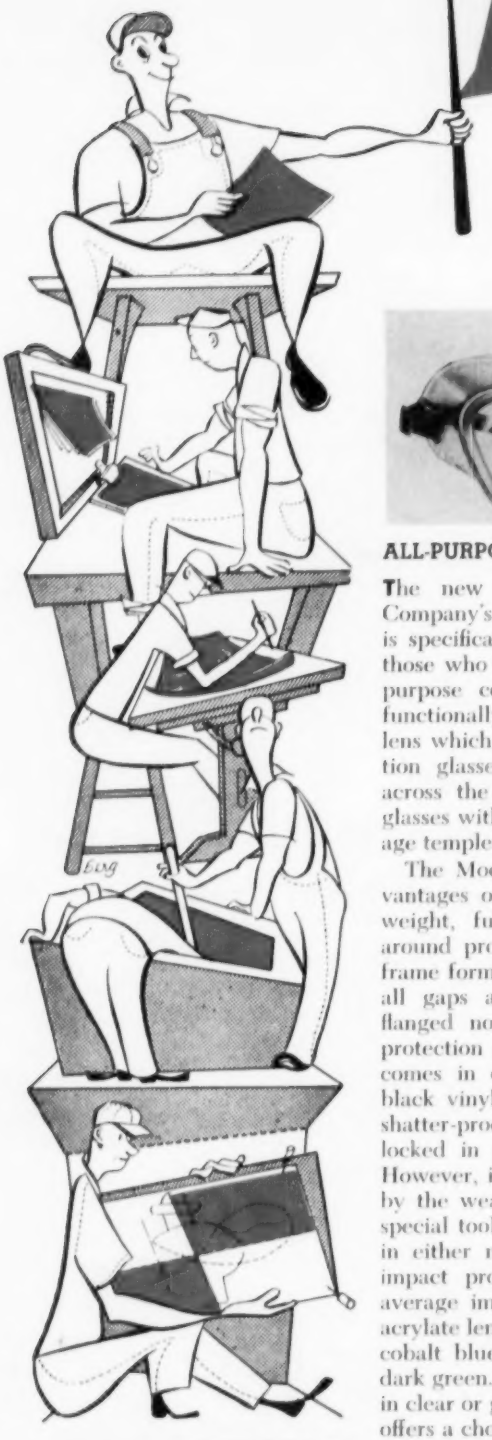


EYE PROTECTION SERIES
other articles May & June

ALL-PURPOSE COVER GOGGLE

The new Watchemoket Optical Company's Model #440M goggle is specifically designed for use by those who need a smaller size all-purpose cover goggle. It has a functionally-designed wide angle lens which fits over most prescription glasses and is wide enough across the brow to accommodate glasses with even higher than average temples.

The Model 440M offers the advantages of greater comfort, light weight, full ventilation and all-around protection. The soft vinyl frame form-fits any face and closes all gaps against eye hazards. A flanged nose bridge gives added protection around the nose. Frame comes in clear, green or opaque black vinyl. The lens is safe and shatter-proof, and it is positively locked in place by a "lock bar." However, it can be easily replaced by the wearer without the use of special tools. The lens is available in either methacrylate for heavy-impact protection or acetate for average impact protection. Methacrylate lens comes in clear, yellow, cobalt blue and light, medium or dark green. The acetate lens comes in clear or green. The Model 440M offers a choice of regular, screen or the new fog-free Stac-Vent ventilation.

For details, use Key # EF-1 on Inquiry Card on page 1.

WELDER'S GOGGLES

An eyecup model welder's goggle, designated type GW, has been announced by the Glendale Optical Co., Inc. Featuring "Glenaire" conditioning, a ventilating method utilized for the company's eyecup types, the goggle prohibits the entrance of harmful infra-red and ultra violet rays while preventing fogging of the lenses.

The nosebridge of the goggle consists of adjustable ball chain, neoprene insulated. The headband is of durable elastic. Non-burning thermoplastic, the company reports, is used for the goggle frame. The 50 mm lenses utilized are available

in a number of shades. The goggles are recommended for oxy-acetylene cutting, lead burning and brazing operations.

For details, use Key # EF-2 on Inquiry Card on page 1.

MODERN STYLE GLASSES

Modern lens styling features the new plastic frame safety glasses announced by Chicago Eye Shield Co. In addition to their fine appearance they have many safety, comfort and convenience features, the company claims.

Frames are rigid and will retain their original shape without bowing. Nose pads are broad-bearing

EYE & FACE PROTECTION DEVELOPMENTS

and give comfortable distribution of weight. A choice of two colors is offered—opaque slate (bluish gray) to eliminate light reflection, or translucent flesh. The new glasses are available in three sizes —No. 375 44 x 37mm.; No. 276 46 x 39mm. and No. 377 48 x 41mm.

For details, use Key **# EF-3** on Inquiry Card on page 1.

ACETATE SAFETY FRAME

Durability and modern styling are combined in a new, all-acetate safety frame developed by the Bausch & Lomb Optical Co. The frame features a new lens shape which provides an improved field of vision, better coverage at the corner areas of the eye, plus attractive appearance. The lenses are Bal-Safe toughened lenses, heat-treated for high impact resistance.

The frame is cut from solid sheet acetate to add strength in the bridge, temple, and endpiece areas. It has rigid or adjustable nose pads and is available with either spatula or cable temples. Safety-cross

plaques on the front temple corners strengthen the endpiece assembly while identifying the glasses instantly as safety eyewear with safety lenses.

For details, use Key **# EF-4** on Inquiry Card on page 1.

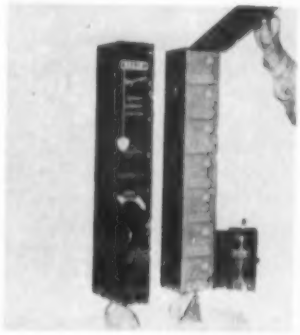
NEW FACE SHIELD

The Pulmosan Safety Equipment Co. has recently introduced a new face shield to its line. Known as the PS 100, it is said to feature a variety of advantages.

The lightweight, comfortable-to-wear face shield incorporates a soft, unbreakable plastic headframe which can be molded to any shape. It includes a slide adjustment with

knurled lock nut to provide for headsizes from 6 to 8½. Snap-in features of its foam rubber sweatband and acetate visor facilitate parts replacement. The face shield is also designed to afford ample room between the face and the visor to reduce fogging. Greater depth of its plastic spark deflector provides added protection. The visors are available in two thicknesses, three lengths and three colors.

For details, use Key **# EF-5** on Inquiry Card on page 1.



LENS CLEANER CABINET

Increased capacity and reduced maintenance are important features of the K-LENS-M Skyscraper, a new lens cleaning cabinet introduced by The Wilkins Co., Inc. It is said to have a capacity of 1400 lintless cleaning tissues and a compartment for a 16-ounce spray bottle of K-LENS-M Liquid Lens Cleaner.

The cabinet has two sections. One section contains a simple-to-operate finger tip-controlled spray bottle of lens cleaner, effective for both glass and plastic goggles. The free-spraying mechanism makes possible clean and economical application of fluid—with no waste. The main compartment contains lens tissues, 4½" x 9" in size, is tamper proof and allows only one tissue to be dispensed at a time. All steel in construction, the unit can be mounted in a space only 4⅞" wide and 28" high on any wall surface or on steel I-Beam supports.

For details, use Key **# EF-6** on Inquiry Card on page 1.

CLOSE-FITTING GOGGLE

The Mine Safety Appliances Co. has recently introduced a chemical splash and impact resistant goggle. Known as Softsides, it features a

flexible, close-fitting frame made of chemical resistant vinyl which provides a comfortable fit, even over prescription glasses. Three frame styles are available, including perforated (to prevent fogging), indirectly ventilated and non-perforated (to protect against dust, etc.)

Impact resistant acetate or chemical resistant vinyl lenses are available for the goggles. The lenses are of one piece construction and offer undistorted wide visibility. Lenses are easily replaceable and may be ordered in clear or green color.

For details, use Key **# EF-7** on Inquiry Card on page 1.

PLANT VISITORS' SPECTACLES

Safety spectacles, specially designed for use by plant visitors, have been introduced by the Glendale Optical Co., Inc. Of lightweight, one-piece construction, they are said to fit all faces, men and women alike.

The lenses available include both clear and green, are optically correct and molded to .060 thickness. Impact resistant, they are recommended by the company for protection against light grinding, spot welding and other semi-hazardous operations. The spectacles also feature modern styling and may be comfortably worn over prescription glasses.

For details, use Key **# EF-8** on Inquiry Card on page 1.

ORBITAL SHAPE CLIP-ONS

Tuc-Over, the safety clip-on manufactured by the Watchemoket Optical Co., Inc., is now available with orbital shape lenses and frame to fit the popular new shape prescription glasses. Made in two sizes to fit all orbital shape prescription glasses frames, they have optically perfect, shatterproof methacrylate Eye Savers lenses, .080" thick, and a tough, resilient, lightweight attractive polyethylene frame.

Tuc-Overs easily snap on or off prescription frames, and are held firmly in place by plastic clips which do not scratch the frame or lenses. A protective visor extends

back to the forehead for over-eyes protection against dust, glare and flying particles. Interchangeable, Eye Savers lenses can be replaced or changed by the wearer without special tools and are available in light or medium green.

For details, use Key **# EF-9** on Inquiry Card on page 1.

UNIVERSAL BRIDGE SIZE EYEWEAR

Duggan Safety Products Co. has introduced a line of safety eyewear designed to fit more than 95 percent of all employees' bridge sizes. Temple length, also adjustable, requires no heating but can be manipulated by hand. The company claims that only three sizes of glasses need be stocked (small, medium and large).

The frames are made from sheet stock, providing extra strength and durability. They are of the modern, prescription-type eyeglass design, and are available in metallic blue and pink crystal colors. Lenses include clear and green heat treated optical lenses.

For details, use Key **# EF-10** on Inquiry Card on page 1.

CHEMICAL EYESHIELD

By using a vinyl hood 11¾ inches long with staggered ventilating baffles, greater ventilation than was normally possible with the old style round hooded vents has been achieved in a chemical eyeshield, according to the manufacturer, U. S. Safety Service Co. Known as the Airflow Chem, splashes, dust and other foreign particles are further screened out by a wrap-around, integrally-molded stainless steel mesh screen. In this manner, air is permited to flow freely, eliminating hazardous fogging. In the cross section shown in the accompanying photograph, the vinyl hood has been cut away to show the flow of air through the splash-proof ventilating baffles.

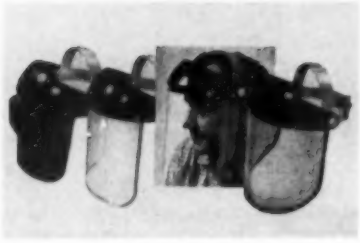
The comfortable eyeshield weighs approximately three oz., and features rolled edges that mold to the natural contours of different faces. It may also be worn over corrective eyewear. Offering high resistance to chemicals, the eyeshield is available in a bright yellow frame (which conforms to the ASA color code for acid operations) and a clear plastic for greater side vision. Special formula optical plastic lenses can be replaced with-

out tools. The manufacturer states that federal specifications are met for optical quality as well as impact and piercing resistance.

For details, use Key **# EF-11** on Inquiry Card on page 1.

NEW LINE OF FACE SHIELDS

The new Musketeer headrest introduced by Jackson Products carries a choice of four types of face shield visors which fasten to the front of its wide spark deflector, pivoted to the headband. Headband and adjustable cross strap are of one-piece molded nylon. Headband is fitted to the head by a large, winged knob and gear while wearing the shield. Nylon friction



pivots also adjust while the shield is in use, locking it in any position or allowing free up and down movement.

As shown in the accompanying illustration, the Musketeer is available with: (left) a fiber visor with welding lens for scarfing, furnace work and heavy gas welding. Also (2) a metal-bound plastic visor in various depths, and (3) a wider, all-plastic visor, both in clear plastic and in shades of green, for use in metal pouring and finishing, spot and flash welding, woodworking, etc. At the right is a 24-mesh wire screen visor, recommended for furnace work and drop forging.

For details, use Key # EF-12 on Inquiry Card on page 1.

SAFETY GOGGLE

This new single eye-piece goggle, introduced by The Fibre-Metal Products Company, improves the view of work being done with its "picture window" while affording safety and comfort to the worker. Trade marked Solo Goggle, it is designed to use standard 2 x 4¼ inch filter lenses and cover glass and to fit over even the largest, latest type safety or personal prescription glasses. The lenses are easily replaceable and are held by a single spring arrangement. No tools are required.

The goggle is available with head rest for pressureless close-to-face fit or for ventilated off-the-face wear. The single center-linkage has easy friction adjustment (the same linkage may be fitted to safety caps). The sweatband-fitted headband has wide range head adjustments. The goggle is also available with an adjustable elastic headband.

For details, use Key # EF-13 on Inquiry Card on page 1.

DAVIS PORTABLE
OXYGEN INHALATOR

- **LIGHT**—weight 9 lbs.
- **COMPACT AND COMPLETE**—handy carrying case, 3½" x 8" x 18½", contains everything needed.
- **ADAPTABLE**—fits any cylinder size.
- **SIMPLE**—only one valve to turn.
- **ECONOMICAL**—sensibly priced.
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- **SAFE**—Reducing valve UL approved.

Write for Bulletin #707

SAFETY DAVIS DIVISION

DAVIS EMERGENCY EQUIPMENT CO., INC.

64 Halleck St., Newark 4, N. J.

(For details, use Key # F-17 on card on page 1)

FIBRE GLASS FACE SHIELD

Featuring a fibre glass spark guard, a new face shield has been introduced by Sellstrom Mfg. Co. The manufacturer says use of this fibre glass material eliminates the moisture-and-heat absorbing characteristics that quickly distort or destroy ordinary face shields used in welding, grinding and other hazardous occupations.

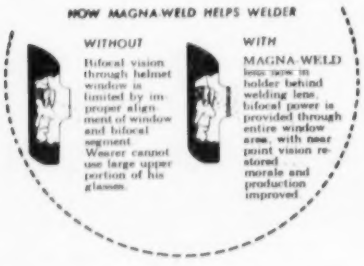
Besides its shape-retaining quali-

ties, the new face shield, known as No. 328, is said to afford a large window area. Coverage around the face is 19 inches, with a choice of either eight or ten inch window height. A ratchet adjustment provides the plastic headgear with a comfortable, exact fit to the head of the wearer. Windows, available in green or clear shades, are easily replaced; they are also supplied with an aluminum binding if desired.

For details, use Key # EF-14 on Inquiry Card on page 1.

MAGNIFYING WELDER'S LENS

An optical accessory for welding helmet windows has been developed by the Sellstrom Mfg. Co. for welders who wear bifocal glasses. The Magna-Weld Plate, designed for use with personal glasses, fits behind the regular hel-


HOW MAGNA-WELD HELPS WELDER
WITHOUT
Bifocal vision through helmet window is limited by improper alignment of window and bifocal segment. Wearer cannot use large upper portion of his glasses.
WITH
MAGNA-WELD lens now in holder behind welding lens, bifocal power is provided through entire window area, with near point vision restored. morale and production improved

met filter lens where it is said to provide magnification for near vision throughout the entire "window" area. (Normally this magnification is restricted to the area viewed through the bifocal segment.) The accessory can be used with any standard welding helmet, and is made of precision ground and polished ophthalmic glass securely mounted in a rugged frame. It restores to the bifocal wearer the use of the large upper portion of his glasses.

Eight focal powers are provided in the Magna-Weld, ranging in strength from the No. .75 (weakest) to the No. 2.50 (strongest). Different power lenses in the same frame are offered on special order.

For details, use Key # EF-15 on Inquiry Card on page 1.

PLASTIC FRAME SAFETY SPECTACLES

The new S-7 square shape plastic safety frames in bronze or crystal pink feature modern styling, light weight and comfort according to the manufacturer, the U. S. Safety Service Co. Safety lenses in opilite (lightweight plastic safety lenses) and hardened glass are available in plano or to any prescription to correct vision. Standard shades of green and rose tint safety lenses are

also available. Two temple types, plastic spatula, and the riding bow cable come in choice of lengths. Four eye-sizes and five bridge-sizes and adjustable or fixed nose pads, simplify equipping employees.

Rugged bridge design is said to make the S-7 frame stronger, while holding lenses in straight alignment to safeguard against prism effects. Safety crosses on each temple identify the glasses as safety spectacles. The entire safety spectacle meets federal specifications.

For details, use Key # EF-16 on Inquiry Card on page 1.

FLEXIBLE PLASTIC GOGGLES

New flexible plastic goggles have been announced by Chicago Eye Shield Co. They are light in weight, durable and are designed to provide comfortable protection

to workers exposed to dust and liquid splash.

These new CESCO #565 goggles are molded from soft vinyl material. They are contoured to fit snugly all around and can be worn over most personal glasses. Wide window lenses are curved to allow full vision. Small perforations, angled away from the eyes, are said to give adequate ventilation. They are available in two lens styles—clear or green plastic.

For details, use Key # EF-17 on Inquiry Card on page 1.

SPECTACLE-EQUIPPED GAS MASK

As a help to personnel who are required to wear prescription eye glasses for accurate vision, Acme Protection Equipment Co. has announced the Acme No. 6 gas mask with built-in spectacle frames. According to the announcement, the new face piece incorporates a support bracket that mounts the spectacle frame for standard lenses ground to the wearer's prescription. This assures perfect mask fit around the temples and ears and eliminates leakage encountered when masks are worn over the usual glasses with ear hooks or temple frames, it is stated.

The "SPEC" mask also features large plastic outer lenses shaped to

provide adequate space for wearing glasses comfortably—and safely. All No. 6 face pieces are equipped with a special boss molded into the face piece onto which the spectacle frames can be readily mounted where desired. The mask is furnished complete with spectacles made up to the wearer's prescription or can be supplied with spectacle frames only, for user to have personal lenses inserted.

For details, use Key # EF-18 on Inquiry Card on page 1.

COMBINATION FRAME SAFETY SPECTACLE

Designed for appearance and comfort, protection and visibility, the Welsh Mfg. Co. has introduced a new combination metal and plastic frame safety spectacle with broader vision, square-shape lens. It features a metal bridge and metal eye wires with colored plastic upper frame structure.

The spectacles may be obtained with green or clear heat-treated glass or CR-39 plastic lenses. They are available in a choice of eye sizes, bridge sizes, temples and frame color.

For details, use Key # EF-19 on Inquiry Card on page 1.

LIFT-FRONT WELDING HELMET

A narrow, deep design welding helmet with lift-front lens holder is being produced by The Fibre-Metal Products Company for easy access to work in close quarters. Designated No. 668–9, the helmet, itself exceptionally light in weight, has the No. 1176 "Dowmetal" Lift-Front glass holder which is insulated on the inside of the helmet. It is equipped with a wide range ratchet adjustment to fit all head sizes; it has two positive stops, two position joints to equalize movement, and is equipped with a padded sweatband for complete comfort. All parts are easily replaceable.

No. 668–9 is formed from a flat sheet of fibre with deeply lapped seams. It is sealed by sturdy, oversize rivets. No protrusions extend outside the helmet to hamper the welder.

For details, use Key # EF-20 on Inquiry Card on page 1.

SQUARED SHAPE PLASTIC EYEWEAR

Following up its recently introduced metal frame safety glasses in the "Squared Shape" design, Sellstrom Manufacturing Co. has announced companion plastic frame models. The 700 Series is said to provide the same pleasing appearance as personal glasses, with greater viewing area than found in previous styles.

The plastic used for the frame

is acetate butyrate, giving it flexibility as well as the strength to withstand the heavier impact of direct blows; yet the frame can be bent or twisted without serious damage. Nose pads, too, are stated to be extra large, assuring more wearing comfort and minimum nose "gouging." A complete selection of frames, in flesh, bronze and green shades is available including side shield models.

For details, use Key # EF-21 on Inquiry Card on page 1.

Building Code

The American Standard Building Code Requirements for Minimum Design Loads in Buildings and Other Structures, sponsored by the National Bureau of Standards and approved by the American Standards Association, is now available in the latest revision. For many years this Standard has been a source of information for states and cities in formulating their building and safety codes.

The standard gives suggested design requirements for live, dead, wind, snow and earthquake loads.

In revising the standard, past experience with wind storms was only one of several items that had to be investigated. Questions arose as to the effect of gusts, the increase of wind velocity with height above ground, and the effect of shape of special types of structures on the pressures produced on them. These and other matters proved to be so complex that a special technical subcommittee for further study of wind effects was appointed. It is planned to include results of the subcommittee's study in the next revision of the standard.

Design requirements for earthquake resistance in the revised Standard are in close agreement with recommended requirements of the Uniform Building Code sponsored by the Pacific Coast Building Officials Conference. As in the case of wind pressures, it is expected that continued accumulation of data and further research will lead to improved requirements as successive editions are issued.

Few changes have been made in those parts of the revised standard related to snow loads. Those sections in which weights of building materials and loads caused by occupancy are presented in terms of weight per square foot have been carefully reviewed and are believed to reflect the best available information.

An appendix gives further explanation of code requirements, and in some cases, details of how the requirements in the standard are derived. As an example, for more effective use of the requirements for earthquake resistance, a discussion of earthquakes in the United States is included in conjunction with a table of important earthquakes in the United States and adjoining regions. This table was prepared by the United States Coast and Geodetic Survey.

The revised edition is available from the American Standards Association, 70 East 45th Street, New York 17, N. Y. Its cost is $1.50.

if you're feeling very well

or if you're feeling queerly

if it's living you want most

have a checkup yearly

Many cancers can be cured if detected in time. That's why it's important for you to have a thorough checkup, including a chest x-ray for men and a pelvic examination for women, each and every year . . . no matter how well you may feel.

AMERICAN CANCER SOCIETY

Ohio's Safety Progress

Ohio's system for preventing industrial injuries is "the best in the nation" according to a report presented to the recent All-Ohio Safety Congress and Exhibit by Richard W. Morse, chairman of the Industrial Commission of Ohio. The report states:

Ohio's job-injury frequency and severity rates are now lower than at any time in recorded history. With fewer injuries per million man-hours worked, Ohio was able to reduce Workmen's Compensation premiums paid by employers by an overall 7.7 percent in 1956.

It now reaches more workers with job-safety programs and messages than any other state. Ohio newspapers, radio and television stations have cooperated by taking the safety story "home" more than 50 million times in the last 12 months.

Forty-six safety advisors from the Division of Safety and Hygiene conducted 16,231 plant inspections last year.

In 1957 special safety programs are helping reduce injuries among the state's highway builders and industrial arts students. A 16-page comic-type book prepared by the Division is now in the hands of the state's 140,000 industrial arts students.

Ohio's 1957 fight against plant injuries centers around the new statewide "Pattern for Progress" program. The Division's 100-page manual details monthly safety themes and meetings. The 1,116 Ohio firms applying this "Pattern" will use more than 6 million pay inserts, posters, shop streamers and wallet cards during the year.

Revised Standard For Grinding Wheels

A proposed revision of Simplified Practice Recommendation R45–47 Grinding Wheels, has been submitted to producers, distributors, users and others concerned for review and acceptance, the Commodity Standards Division, Office of Technical Services, U. S. Department of Commerce, has reported. This revision was proposed by the Grinding Wheel Institute, the sponsors of the first issue of the recommendation and subsequent revisions. It has received the individual approval of most manufacturers and of the members of the industry Standing Committee.

The recommendation establishes use classification and type and size classification of grinding wheels currently in general production and demand. The use classification gives the standard shape, types and sizes classified according to basic uses. The type and size classification gives standard shape types with detailed dimensions classified by shape types. Both classifications are profusely illustrated.

In addition to a brief summary of the changes effected by the proposed revision, the recommendation also contains a table of contents, a key to the letter dimensions on the illustrations, and cuts showing standard shapes of grinding wheel faces.

Copies of the proposed revision may be obtained from the Commodity Standards Division, Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C.

Driver School

The North Carolina Truck Driver Training School will hold its 100th consecutive class September 2–27, 1957. This class will also mark the opening of the school's 9th year of operation. Under the direction of the North Carolina State College Extension Division and in cooperation with the N. C. Motor Carriers Association, the school has enrolled more than 2,000 professional truck drivers from nearly every state in the nation as well as from Alaska and Canada.

The college conducts 12 four-week courses throughout the year with 20 to 25 students in each. The monthly course covers Interstate Commerce rules and regulations, accident prevention and reporting, as well as other classroom fundamentals. During the afternoons, students practice basic driving skills as well as road and city driving. The monthly courses conclude with practical and written examinations.

THE FIRE FRONT

Neale Re-elected

John A. Neale was re-elected president of the National Fire Protection Association at the close of the first general session of the fire safety group's 61st annual meeting at the Hotel Statler in Los Angeles.

Mr. Neale, chief engineer of the National Board of Fire Underwriters, New York, first took office as president of the NFPA last year. He has been active in the Association for over 33 years and has served as an officer and director for the past 11 years.

Also re-elected to NFPA offices for the coming year were: 1st vice president, Chief Henry G. Thomas, Hartford (Conn.) Fire Department; and 2nd vice president, Loren S. Bush, chief engineer, Board of Fire Underwriters of the Pacific, San Francisco.

Fire A Challenge To Architects

A fire protection engineer has called upon architects, along with engineering schools and others concerned with building design, to assume a larger share in fighting the peril of fire to the nation's factories, historic landmarks, homes and other buildings.

"Areas of unnecessary ignorance" are delaying fire-safe building design, Chief Engineer Horatio Bond of the National Fire Protection Association told the 61st annual meeting of the NFPA.

Solution of many fire problems involving combustibles in buildings, the size and shape of structures, hazards from heat, smoke and poisonous gases, and the use of automatic sprinkler systems "must be done on the drawing boards," Bond said.

Fire laws and regulations, alone, are not the answer, the non-profit, fire-safety organization was told. Bond said architects should fully understand individual fire problems and provide "intelligent and imaginative solutions." In working to reduce areas of ignorance, Bond said, the NFPA has "enjoyed the assistance of a number of distinguished architects."

"Instead of getting . . . an intelligent and imaginative treatment," he said, "fire problems are too often simply ignored not only by architects, but by others."

Ignoring of safety factors contributed to "the biggest industrial fire disaster in history in the General Motors Plant at Lavonia," Bond said.

A British city planner and the Editor of the Journal of the Royal Institute of British Architects, assigned to study fire effects as revealed in the wartime bombing of British cities, compared fire protection with other subjects to which architects give attention. Bond quoted them as follows:

"Fire protection has been neglected; its principles are not generally understood; its practice is hardly taught at all."

"Eventually," he said, "the content of courses in architectural and engineering schools must cover these areas of ignorance."

Among many "areas of ignorance," he listed these six for consideration:

1—The effect of the bulk of combustible materials in a building.

2—The way in which the dimensions of a building affect fire problems ("In general, architects have no real appreciation of the job of fire fighting which may be presented by certain room spaces and building spaces," Bond said).

3—Hazards from accumulating heat, smoke and poisonous gases—the need for roof vents.

4—The fire characteristics of materials—ranging all the way from plastic panels to steel girders. ("The behavior of steel at fire temperatures is simply ignored," Bond said.)

5—Understanding the value of automatic sprinkler systems in protecting property and human life. ("Water damage is always likely to be greater in the unsprinklered than in the sprinklered building," said Bond.)

6—The rate of surface flame spread over materials used for walls and ceilings. (As heat builds up from a small, starting fire, Bond said, fire may suddenly flash over an entire wall surface so fast as to prevent escape.)

First Quarter Losses Show 13 Percent Rise

Estimated fire losses in the United States during April amounted to $85,994,000, the National Board of Fire Underwriters has reported. This loss represents an increase of 1.6 percent over losses of $84,624,000 reported for April, 1956, and a decrease of 17.8 percent from losses of $104,565,000 for March (1957).

Losses for the first four months of 1957 now total $401,400,000, an increase of 13.1 percent over the first four months of 1956, when they amounted to $354,952,000. These estimated losses include an allowance for uninsured and unreported losses.

Pulverized-Coal Code

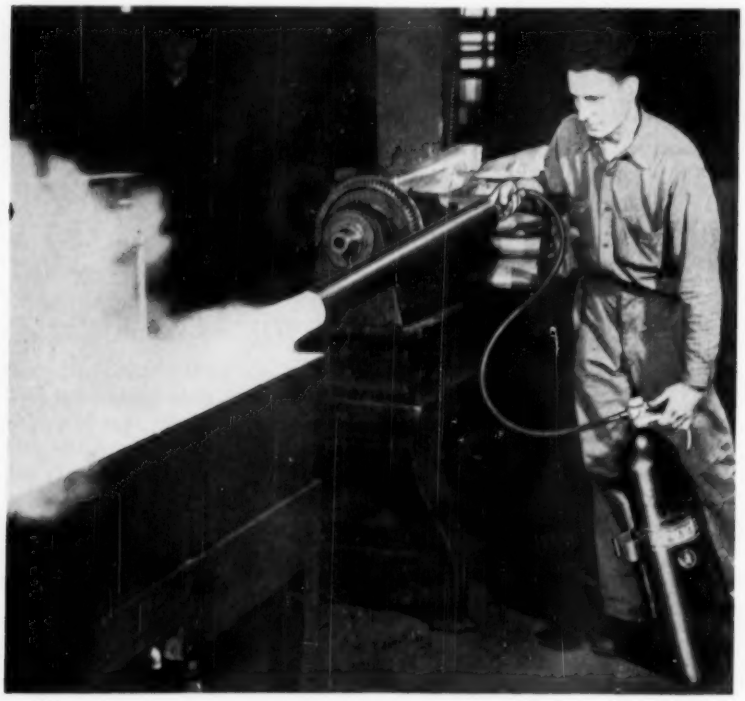
A new Code for the Installation and Operation of Pulverized-Coal Systems, NFPA No. 60A, has just been published by the National Fire Protection Association. It covers building construction and equipment, installation of pulverized-coal systems, lighting and operating pulverized-fuel systems and fire prevention and fire protection precautions. Available from the NFPA, 60 Batterymarch Street, Boston 10, Mass., at $.35 per copy.

KNOW YOUR FLAMMABLE LIQUIDS

The accompanying table, prepared by the National Board of Fire Underwriters, gives pertinent data concerning the fire and explosion hazards of flammable liquids and gases found in commercial, industrial, and processing plants. Familiarity with the properties and characteristics of these flammable liquids and gases is important so that firemen can fight fires more effectively, reduce property damage and save lives. The data used in the table have been compiled from the best sources available, but minor variations in the flash points, flammable limits, ignition temperatures and in other data are to be expected because of variations in technique in making a determination.

LIQUIDS HANDLING SERIES
other articles June & August

Flash Point: The flash point of a flammable liquid is the lowest temperature at which the liquid gives off sufficient vapors to form a flammable mixture when mixed with air near the surface of the liquid. Stated another way, the flash point is the lowest temperature at which a flammable liquid, when heated in the presence of a source of ignition and sufficient air, will flash but not continue to burn. The flash point figures in the table are closed cup determinations except where followed by the designation (oc) which means the determination was made by an open cup method. The open cup flash point is usually somewhat higher than the closed cup flash point for the same substance.



Fire Point: The fire point (not shown in the table) is the lowest temperature at which a flammable liquid, when exposed to a source of heat and in the presence of sufficient air, will give off sufficient vapors to ignite and continue to burn. The fire point is usually a few degrees above the flash point.

Explosive Limits (Flammable Limits): The explosive or flammable limits include all concentrations of a mixture of flammable vapor or gas in air, usually expressed in percent by volume, in which a flash will occur or a flame will travel if the mixture is ignited. The lowest percentage at which this occurs is the lower explosive limit, and the highest percentage, the upper explosive limit. If such a mixture is confined and ignited, an explosion results. Many common flammable liquids and gases have very wide explosive ranges. Mixtures outside these limits are either too "lean to burn" or too "rich to burn." The first mentioned mixture is below the lower explosive limit since it does not have sufficient flammable vapor or gas in proportion to the amount of air while the latter mixture has too much flammable vapor or gas in proportion to the available air. The explosive limit figures in the table are based upon normal atmospheric temperatures and pressures.

Ignition Temperature: The ignition temperature of a flammable liquid or gas is the lowest temperature required to initiate or cause

Name	Synonyms	Flash Point (Deg. F. Closed Cup)	Explosive Limits (% by Volume) Lower	Upper	Ignition Temperature Deg. F.	Specific Gravity (Water = 1.0)	Density of Vapor (Air = 1.0)	Rate of Diffusion (Air = 1.0)	Boiling Point Deg. F.	Suitable Extinguishing Agents
Acetaldehyde	Ethanal Acetyl Aldehyde	-36	4.1	55	365	0.78	1.52	0.81	70	3
Acetic Acid (Glacial)	Ethanoic Acid	104	5.4		800	1.05	2.07	0.74	245	1, 2A, 3
Acetone	2 Propanone Dimethylketone	0	2.6	12.8	1000	0.79	2.00	0.71	134	1, 2A, 3
Acetylene	Ethyne	Gas	2.5	81	635	none	0.90	1.05	-119	4
Acrylonitrile	Propenenitrile	32(oc)	3.0	17	898	0.80	1.83	0.74	171	2A, 3
Ammonia (Anhydrous)		Gas	16	25	1204	none	0.58	1.28	-37	4
Amyl Acetate - n	Banana Oil	77	1.1		750	0.88	4.49	0.48	300	2, 3
Asphalt	Petroleum Pitch	400+			905	0.95-1.1			700	1, 2, 3
Benzene	Benzol	12	1.4	7.1	1000	0.88	2.77	0.61	176	2, 3
Butadiene - 1, 3	Erythrene	Gas	2.0	11.5	842	0.62	1.87	0.73	24	4
Butane - n	Methylethylmethane	Gas	1.8	8.4	1010	0.58	2.01	0.70	14	4
Butyl Alcohol	1 - Butanol	84	1.4	11.2	650	0.81	2.55	0.63	243	1, 2A, 3
Carbon Disulfide	Carbon Bisulfide	-22	1.3	44	212	1.30	2.64	0.62	114	1, 3
Carbon Monoxide		Gas	12.5	74	1204	none	0.97	1.01	-314	4
Cellosolve	Ethylene Glycol, Monoethyl Ether	104	1.8	14.0	460	0.93	3.10	0.57	275	2A, 3
Chlorobenzene	Phenyl Chloride	65	1.3	7.1	1100-1200	1.11	3.88		270	2, 3
Cyclopropane	Trimethylene	Gas	2.4	10.4	928	none	1.45	0.83	-29	4
Dichloroethylene - 1, 2	Acetylene Dichloride	43	9.7	12.8		1.28	3.35	0.55	141	1, 2, 3
Ethane	Methylmethane	Gas	3.0	12.5	950	none	1.04	0.98	-128	4
Ethyl Alcohol	Ethanol	55	4.3	19.0	793	0.79	1.59	0.78	173	1, 2A, 3
Ethyl Bromide	Bromoethane		6.7	11.3	952	1.43	3.76	0.52	100	1, 3
Ethyl Chloride	Chloroethane	-58	3.8	15.4	966	0.91	2.22	0.67	54	3
Ethyl Ether	Diethyl Ether	-49	1.9	48	356	0.71	2.56	0.62	95	2A, 3
Ethyl Methyl Ketone		30	2.0	10.1	374	0.70	2.07	0.63	50	3
Ethylene	Ethene	Gas	3.1	32	842	none	.98	1.01	-155	4
Ethylene Dichloride	1, 2-Dichloroethane	56	6.2	16	775	1.26	3.42	0.54	183	1, 2, 3
Ethylene Oxide	1, 2-Epoxyethane	<0	3.0	80	804	0.89	1.52	0.81	51	1, 3
Fuel Oil No. 1	Range Oil	100	0.7	5	490	<1.0		0.47	304-574	2, 3
Fuel Oil No. 2	No. 3 on West Coast; Diesel Oil	100			494	<1.0				2, 3
Fuel Oil No. 4		130			505	<1.0				1, 2, 3
Fuel Oil No. 5		130				<1.0				1, 2, 3
Fuel Oil No. 6		150			765	1.0±				1, 2, 3
Gas, Illuminating		Gas	5.3	31	1094	none		1.24		4
Gas, Natural		Gas	3.8	13		none		1.34		4
Gas, Oil		Gas	6.0	13.5	637	none				4
Gas, Producer		Gas	14.1	95.6		none				4
Gas, Water		Gas	7.0	72		none				4
Gasoline		-45	1.4	7.6		0.75	3.0-4.0	0.53	100-400	2, 3
Heptane		25	1.0	6.0	452	0.68	3.45	0.54	208	2, 3
Hexane - n		-15	1.2	7.5	500	0.66	2.97	0.58	156	2, 3
Hydrazine			4.7	100	518	1.01	1.10	0.95	236	
Hydrocyanic Acid	Prussic Acid	0	6	14	1000	0.70	0.93	0.82	79	1, 4
Hydrogen		Gas	4.0	75	1085		0.07	3.81	-422	4
Hydrogen Sulfide		Gas	4.3	45	500		1.18	0.93	-76	4
Kerosene	No. 1 Fuel Oil	100	0.7	5	490	<1.0		0.47	304-574	2, 3
Lubricating Oil	Paraffin Oil	300-450			500-700	<1.0			680	1, 2, 3
Methane	Marsh Gas	Gas	5.3	14.0	999		0.55	1.34	-250	4
Methyl Alcohol	Methanol	52	7.3	36	867	0.79	1.11	0.95	147	2A, 3
Methyl Chloride	Chloromethane	Gas	10.7	17.4	1170	0.92	1.78	0.75	-11	4
Mineral Spirits	Turpentine Substitute	104	0.77 @ 212°		473	0.80	3.9		300	2, 3
Naphtha, Safety Solvent	Stoddard Solvent	100-110	1.1	6.0	450-500	<1.0			300-400	2, 3
Naphtha, V. M. & P.	Petroleum Naphtha	20	0.9	6.0	450	<1.0	3.75		212-320	2, 3
Naphthalene	White Tar	176	0.9	5.9	1038	1.15	4.42	0.48	424	1, 3
Pentane	Amyl Hydride	<-40	1.5	7.8	588	0.63	2.48	0.64	97	2, 3
Petroleum, Crude		20-90				<1.0				2, 3
Phenol	Carbolic Acid	175			1319	1.07	3.24	0.55	358	1, 3
Propane	Dimethylmethane	Gas	2.2	9.5	871		1.56	0.81	-45	4
Styrene	Vinylbenzene	90	1.1	6.1	914	0.91	3.60		295	2, 3
Toluene	Toluol	40	1.4	6.7	1026	0.87	3.14	0.56	232	2, 3
Transil Oil	Transformer Oil	295(oc)				0.90				1, 2,3
Turpentine		95	0.8		464	<1.0	4.84	0.46	300	2, 3
Vinyl Chloride	Clorethane	<0	4	22		0.97	2.15	0.68	7	4
Xylene-o	o-Xylol	63	1.0	6.0	900	0.88	3.66	0.52	291	2, 3

self-sustained combustion in the absence of a spark or flame. This is also known as the auto or autogenous ignition temperature. This temperature varies considerably, depending upon the nature, size, and shape of the igniting surface, container or other factors.

Specific Gravity: The specific gravity of a material is the ratio of the density of the material to the density of some standard substance. The specific gravity of a liquid expresses the density of the liquid with reference to the density of water. Liquids with a specific gravity greater than one are heavier than water, and liquids with a specific gravity less than one are lighter than water.

Vapor Density: The vapor density of a flammable vapor or gas is the relative density of the vapor as compared with air when the density of air is taken as one.

Rate of Diffusion: The rate of diffusion of a flammable vapor or gas is a measure of the relative speed a vapor or gas will mix in an absolutely still atmosphere with air when air is taken as one. The rate at which any vapor or gas will mix with other gas depends upon the molecular weight values. Therefore heavier gases diffuse more slowly than light gases.

Boiling Point: The boiling point of a liquid is the temperature of a liquid at which the vapor pressure of the liquid equals the atmospheric pressure. Therefore, the lower the boiling point the more volatile and generally the more hazardous is the flammable liquid.

Spontaneous Heating: Spontaneous heating is the ability of a flammable liquid to combine readily at ordinary temperatures with the oxygen of the air to produce heat. When these liquids are present on rags or other material under conditions in which heat is produced faster than it is dissipated, the temperature rises and spontaneous ignition may occur. Of the materials listed in the table, turpentine is the only one susceptible to spontaneous heating.

Miscibility with Water: The miscibility of a flammable liquid with water is an indication of its ability to mix with water. The property is important in fire fighting since the flash and fire points of a flammable liquid are appreciably raised as the amount of water in the mixture is increased.

Extinguishing Agents: The extinguishing agents in the last column of the table are coded according to the following schedule:

1–Water, 2–Foam, 2A–Alcohol Foam, 3–Carbon Dioxide or Dry Chemical, and 4–Stop Flow of Gas (see note).

NOTE: While carbon dioxide, dry powder and sometimes water spray can extinguish small gas fires if the extinguishing medium is applied at the source of the fire, the best procedure is to shut off the source of gas. Extinguishment without shutting off the source of gas will permit unburned gas to accumulate creating a potential serious explosion hazard.

Picture by courtesy of Randolph Laboratories, Inc.

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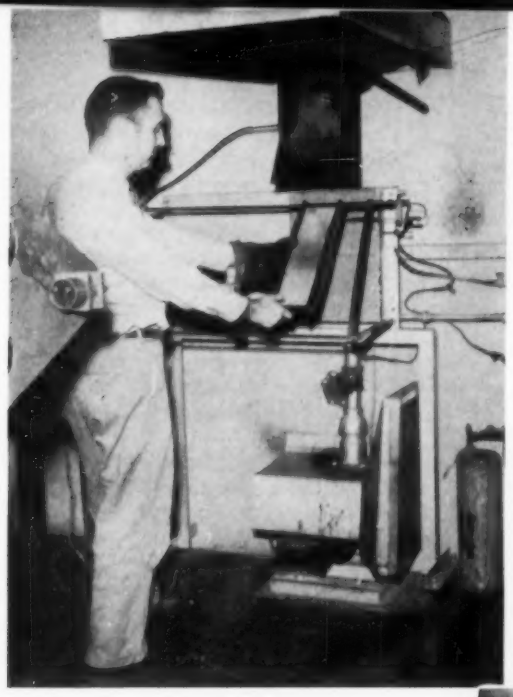


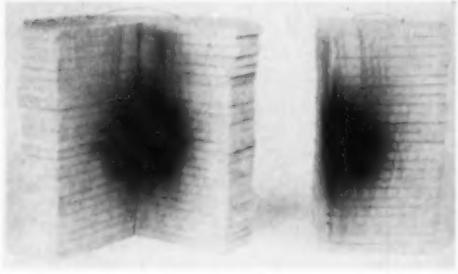
Research at the National Bureau of Standards is revealing new facts and theories about:

Spontaneous Combustion
Fire Detection
Surface Flammability
Dry Chemical as an Extinguishant
Fire-Barrier Construction

Fig. 1.—Technician (above) puts specimen in flame spread apparatus. Result will help set flame spread rating for this material.

Fig. 3—(At right) Experimental fire is being attacked with extinguisher. Better extinguishing agent, performance guide is goal.

Fig. 2.—(Below) Charred fireboard figured in tests which may give clearer picture of mechanism of slow combustion reaction.



Recent Research in Fire Protection

Current advances in fire protection technology at the National Bureau of Standards may provide a means to reduce further the loss of lives and property due to accidental fires. Many of the Bureau's recommendations have already been incorporated in underwriters' and municipal building codes, with consequent savings in life and prevention of property damage. However, there is a continuing need for technical information on the fire hazard properties of new building materials and structural assemblies. A better knowledge of the basic mechanisms of ignition, spread, and extinguishment of fires is essential for effective fire prevention and control.

Much of the Bureau's activity in these areas results in technical papers and reports which make data available to science and industry. Such information is frequently used as the basis of equipment design, specifications, and building codes.

To provide basic information on ignition phenomena and fire resistance of materials, on flame detection and extinguishment, and on fire growth and spread, the Bureau has, since 1914, carried on an extensive program of research and development in the field of fire

Fig. 4—In the series of six photos at left, the number of gasoline-filled cups is increased in successive tests to reveal interaction of flames. Group at right shows spread of fire over surface of fuel oil.

protection. This program, now under the direction of A. F. Robertson, was initiated to resolve the early inconsistencies of building code requirements for fire protection of building structural elements. The objective of the work was to furnish architects, engineers, city officials, and insurance companies with technical information on the behavior of various materials under the special conditions found in burning buildings. To date, about two-thirds of the more than 600 building construction fire resistance ratings published by the National Board of Fire Underwriters [1] are based on the results of NBS studies. Other indications of the success of this activity may be found in the standard fire-resistance test methods and in the studies of the compressive strengths of building materials at elevated temperatures.

In recent years the major emphasis of the program has shifted. Less time is now being spent on determining the fire resistive properties of constructions, and more attention is being given to studying methods for characterizing the important parameters involved in fire protection work. These latter studies have included self-ignition behavior of materials, detection of fires by flame characteristics, methods of measuring surface flammability of materials, mechanisms by which extinguishing agents are effective in fire control, and behavior of materials and constructions as fire barriers.

Self-Ignition of Materials

Ignition characteristics of materials have frequently been reported in terms of an ignition temperature.[2,3] Such critical temperatures are very elusive. They appear in most cases to depend on the conditions of the experiment and can seldom if ever be considered physical constants of the materials studied. The Bureau is working to obtain a clearer picture of the actual mechanism of slow combustion reactions and the conditions under which they take place. Experience with solids in constant-temperature ovens [4] has revealed the desirability of making measurements in such a manner

that specimen size has little if any effect on the experimental results.

An adiabatic furnace [5] has proved useful in analyzing ignition behavior under such conditions. Work to date with this equipment indicates that the slow ignition reaction of wood and other cellulosic materials displays the general characteristics of a simple first-order chemical kinetic reaction. This is not strictly the case, however, since there is now evidence that a large number of different reactions are taking place. Nevertheless, it is believed that this method of test provides one of the most useful methods of evaluating the potential storage hazard for bulk materials that may be subject to self ignition. Eventually it may become possible to develop charts that predict safe storage practices for such materials in terms of material involved, ambient temperature, size of piles of material, and type of ventilation.

Fire Detection

Recent work in fire detection has been confined to studying the properties of flames likely to occur in aircraft engine spaces.[6, 7, 8] The main problem was to ascertain those properties that can be utilized for fire detection. Particular attention has been directed toward radiant characteristics of such flames. Flicker characteristics were studied and found to occur simultaneously in five spectral bands between 0.23 and 2.5 microns. Results of the work indicate that reliability of the fire detection system can be greatly increased if it is designed to respond only when several intrinsic properties of the flame are all present at the same time. Properties suggested as useful for such purposes include (1) characteristic rate of increase of radiant flux, (2) sufficient level of radiant flux in the required spectral region, and (3) characteristic frequency of flicker.

Surface Flammability

The rate at which fires grow within a building is affected by the type of interior finish used in the construction. Other variables such as combustible content, ventilation, degree of compartmentation, and configuration also seem to be important.

Studies of the rate of growth of fires in buildings are desirable if the hazards to life and property are to be assessed quantitatively. However, the cost and the effort that must be expended on full-scale fires are strong deterrents to such investigations. Immediate attention has therefore been given to developing a laboratory flame spread test method for evaluation of surface flammability.[9]

In this method, ignition is forced at the top of an inclined specimen surface so that combustible gases and flames rise while the flame front on the specimen surface progresses downward. The rate at which the flame moves depends on the characteristics of the material. Both rate of flame travel and rate of heat release (as indicated by exhaust stack thermocouple temperature rise) are observed and their numerical values are combined in an arbitrarily established

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equation which gives a flame spread index.

The test provides manufacturers and testing laboratories with a reproducible means of studying flammability on a small scale. Acceptance of the flammability ordering achieved by this method as a true indication of fire hazard of the material tested must await full-scale fire growth studies. Other laboratories have elected to use model structures [10] whose behavior has been correlated with a limited number of fire tests of full-size rooms. While excellent progress has been made in these studies, additional work must be done before real confidence can be placed in the general use of such models.

Methods for Extinguishing Fires

New variations of the "dry chemical" type of fire extinguisher have recently appeared. In most cases the extinguishing agent used is a specially processed sodium bicarbonate powder. Evaluation of such devices with respect to other types of extinguishers has accentuated the need to understand the mechanism by which they achieve their effectiveness.

For several years the Bureau has been conducting experiments related to the complex problem of fire extinguishment, and considerable progress has been made.[11] The frequently mentioned theory that dry powder extinguishes flammable liquid fires by release of carbon dioxide does not appear to be tenable. Fires have been quickly extinguished by relatively inert powders such as silica. Optical measurements have been made of the effectiveness of dry chemical in shielding the fuel against radiation from the flames. These experiments show that on actual fires the cloud of dry chemical does form an effective radiation barrier, thus reducing the effectiveness of radiation from the flames in vaporizing fuel in a form suitable for combustion. The minimum concentration of the agent necessary for extinguishment has been measured in laboratory experiments.

Improved Agents

The results of these studies are expected not only to permit the selection of more effective fire extinguishing agents but also to provide a better understanding of the parameters which should be considered in evaluating extinguisher performance. While there is definite indication that the radiation shielding effect is important, there is also considerable evidence that some additional mechanism is present in breaking the combustion chemical chain reaction.

Fire Barriers

Studies of the fire resistance of materials and structures have been carried on almost continuously since inception of the fire protection program. Because of the many structural variations and the complexity of analysis of thermal and mechanical behavior, these studies have usually been empirical. A standardized test method determines the fire resistance performance of materials and evaluates it in terms of the exposure time during which the structure maintains stability and prevents excessive heat transfer. The behavior of such simple structures as monolithic concrete slabs during such tests is extremely complex. The presence of water, chemically bound and absorbed, seems desirable in such a structure since the latent heat capacity is very large and may serve to increase the fire endurance. However, in certain types of concrete, large amounts of absorbed water may be harmful. The pressure developed from water vaporizing within specimens has been blamed for severe spalling in several cases.

Heat Transfer

An effort has been made to solve the heat transfer problem in such a slab by numerical approximation techniques. A method was devised for handling the conversion of water to steam within the specimen. The migration of moisture through the specimen was assumed to take place in a variety of ways. It became clear from this work that the number of variables to be arbitrarily selected made it unlikely that a solution based on such assumptions would represent the true behavior. In spite of these difficulties, it still seemed desirable to calculate on SEAC, the Bureau's high-speed electronic digital computer, the temperature distributions which would exist under assumed conditions. It was considered likely that even if the effects of moisture were neglected, solutions for a wide range of specimen sizes might provide a better understanding of the scaling relationships among different-sized specimens of geometrically similar design.

In order to achieve reasonable answers in making these concrete slab computations, it has been necessary to use values of thermal diffusivity which differ by a factor of three from handbook values. For these computations it had been assumed that conduction alone was sufficient to account for heat transfer. However, this is not true; the migration of moisture provides another important transfer mechanism. There is also evidence that radiant heat transfer is an important factor during fire exposure of cellular concretes. Further work should be done on measurement of thermal properties during such transient heating conditions. Problems such as these must be solved in quantitative fashion before real confidence can be placed in theoretical analysis.

Based on a paper presented at the Fire Research Correlation Conference under the auspices of the Committee of Fire Research of the National Academy of Sciences and the National Research Council. To be published by the NAS-NRC, publication no. 475.

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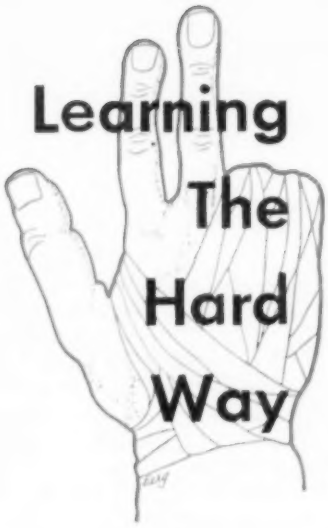
Pictures by courtesy of National Bureau of Standards.



RIGHT WAY IS SAFE WAY AND PROTECTION PREVENTS INJURIES

The scene of the accident was a warehouse. An employee had been instructed to get a palletboard. He went to the stack of empty pallets and grasped the top one by the near edge. As he pulled it out from the pile, the back edge fell down on his foot and crushed several toes. Proper instruction in handling pallets by grasping them as near the center of gravity as possible would have prevented the accident. Safety shoes would have prevented the toe injuries.

THE FIT COUNTS TOO

A maintenance worker was removing a steel chain pin with a hammer. A small steel chip broke off from the pin, flew up into his face, happened to pass through a small vulnerable opening between the bottom of his safety goggles and his face, and struck his right eye. It was evident that the employee's cover goggles did not properly fit. It is not enough to provide safety goggles, they must also fit each individual wearer properly.

LITTLE FIRE, BUT COSTLY

Welding sparks again! This time a contractor's welder was welding some new piping in a pit which contained tanks of flammable liquids, fortunately with high flash points. The welder took no protective precautions and a welding spark started a fire in an oily spot. The fire was quickly extinguished but it had already damaged an electrical panel with switches and wiring. The electrical damage caused a rolling mill to shut down for several hours.

BUCKET ACCIDENT BRIGADE

Buckets left at the foot of ladders can be a pitfall. In one recent case, the pail was empty, but a workman descending the ladder stepped into it, lost his balance, fell and broke his hip. In another accident, the bucket contained gasoline. The workman's trousers became saturated when he stepped backward into the pail and somehow the gasoline became ignited, resulting in serious burns. These accidents point up the necessity of not leaving pails, tools and other equipment at the foot of ladders. Also, what about that gasoline in an open bucket?

DRESSED FOR AN ACCIDENT

A lathe operator was wearing a machinist's coat, the sleeves of which buttoned at the cuff but left an open gap at the wrist. The revolving chuck caught the sleeve and pulled the operator into the machine. His injuries were fatal. If long sleeves are permitted for machine operators, they must have tight cuffs; but it is safer to roll them up or wear short sleeves.

ON THE REBOUND

A worker was using a portable grinding wheel when the wheel broke. A piece of the emery struck a nearby surface, rebounded, and hit and fractured the worker's jaw. There were several possible causes for the breaking of the grinding wheel. The worker may have put too much pressure on the side of the wheel; the wheel may have been damaged by too much tightening of the nut; or it may have been the wrong wheel for the machine. There are also guards available for portable grinders.

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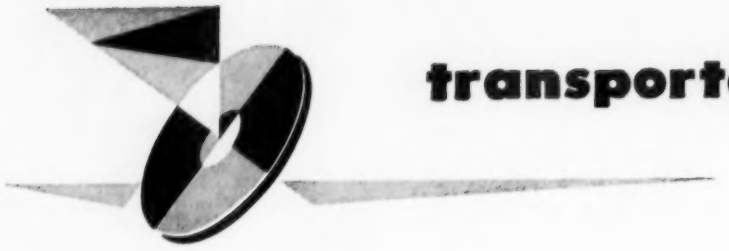

transportation safety

Driving Safety

"Heedless Horsepower" has been named by The Travelers Insurance Companies as the fundamental cause of our ever-mounting toll of disaster on U. S. highways. The 23rd annual highway safety booklet published by The Travelers this year reports on the 1956 highway toll that saw 40,000 Americans lose their lives and 2,368,000 more injured—an increase of nearly six percent in fatalities and almost 10 percent in injuries over the 1955 record. More than 2,700,000 copies of the booklet have been printed for free distribution.

"Everyone who is in a position to influence drivers should learn that horsepower, in the hands of the heedless, is the fundamental cause of our ever-mounting toll of disaster," the booklet stated.

Despite the large number of safety devices embodied in cars today, any combination of speed plus carelessness, thoughtlessness and lack of consideration turns the present high-powered cars into missiles of death.

In reviewing last year's grim record, the report shows that excessive speed again topped the list of driver actions resulting in death. A total of 13,830 died and 798,920 were injured in crashes blamed on speed.

Another dismal mark on the record was the number of pedestrian fatalities, 8,080 killed and 225,000 injured—an increase of nearly 3,000 casualties over 1955's figure and marking the first time in six years that this figure has not lowered from the year before.

Copies may be obtained from: Public Information Department, The Travelers Insurance Companies, Hartford, Conn.

Brinley Cited for Traffic Safety Work

The National Safety Council has announced the selection of Robert M. Brinley of Paramus, prominent New Jersey insurance consultant, as one of seven recipients in the country of national Safety Citation Awards. The award, a 14-inch bronze statuette and plaque, is in recognition of Brinley's outstanding contributions in the field of traffic safety in 1956.

Ned H. Dearborn, president of the National Safety Council, made this comment on the announcement of Brinley's selection from more than 800 nominees for this national honor:

"Mr. Brinley has worked tirelessly through the Bergen County and Paramus Safety Councils and in co-operation with local law enforcement agencies to further traffic safety and public acceptance of safe practices. He led a program of public information and education that is credited with helping reduce the number of area traffic accidents. He stimulated local newspapers to give their support to traffic safety programs and wrote a series of informative articles on the value of automobile safety seat belts. Taking time from his profession as an insurance consultant, Brinley has traveled widely throughout the country interviewing officials of numerous safety councils to obtain information on operating procedures and statistics. His efforts to focus public attention on unsafe highway conditions has resulted in corrective actions, and his leadership in traffic safety has brought national recognition to both safety councils with which he is associated, and has set an example for other public-spirited citizens throughout the nation."

Do Drivers Know What They're Doing?

Even experienced drivers do not actually see and recognize traffic conditions and situations. They could learn to see them much better than at present. Furthermore, driver inattention, which leads to unsafe driving acts, is probably responsible for many more accidents than previously supposed.

These were the results of some preliminary tests conducted by the Traffic Institute of Northwestern University in cooperation with the Wisconsin Motor Vehicle Department. The tests utilized a different type of procedure called "commentary driving." In this method the driving student and instructor behind the wheel comment on their intentions, observations, and actions. These "talking" driving tests revealed the following:

1. Most drivers do not "see" traffic signs. They can't tell the types of signs they should have seen, nor do they see their actual speed as it registers on the speedometer.

2. Experienced drivers do not have a good understanding of traffic rules and regulations.

3. Even drivers with long experience cannot concentrate on the over-all requirements of driving. When asked to find a named street and make a turn at the same time they are commenting on their driving, many drivers missed the street completely or were already in the intersection before they recognized the street sign.

4. Most of the drivers felt they were improved by this type of test—that they were made more aware of the many requirements involved in the driving task.

5. The tests are of particular value to experienced drivers.

Sun Glare Cuts Night Vision

Motorists who fail to protect their eyes while driving in bright sunlight or get behind the wheel of their cars at dusk after prolonged exposure to the sun during the day, are sufficiently "glare-fatigued" to be dangerous summertime threats to the safety of the nation's highway.

This warning was sounded by Dr. Edgar W. Tillyer, widely known physicist and director of ophthalmic research committee of the Sun Glass Institute.

Labeling sun glare as one of the highway's greatest enemies and stating that its effect in producing a loss of retinal sensitivity is not fully understood by the driving public, Dr. Tillyer said that sunglasses play a dual role in reducing traffic fatalities.

Dr. Tillyer, for many years, was director of ophthalmic research for American Optical Company and now is consultant to the company's research bureau.

"With today's new wrap-around windshields, sun glare now dazzles the driver from three different directions," said Dr. Tillyer. The wider glass area, increased use of chrome trim and light-reflecting colors on new cars produces a greater strain on the driver's eyes unless they are protected with sunglasses. Sun visors help but they only eliminate overhead glare, not glare coming at eye level, at the sides or from reflections below." Contributing indirectly to the problem, said the scientist, are reflections from buildings.

Glare Protection

But the big problem comes with night driving, Dr. Tillyer pointed out. The ability of vision to adapt itself to nighttime driving depends on adequate glare protection during daylight hours. Scientific studies conducted by university ophthalmologists show that those who expose their eyes to excessive sunlight without the protection of sunglasses can lose as much as 50 percent of their night vision. This loss of night vision is dangerous to persons driving home from a day in the bright sun, from beaches, pools and picnics.

Explaining this phenomena, Dr. Tillyer stated: "The sun burns up a chemical on the retina of the eye known as visual purple. Loss of this chemical, used up faster than nature can restore it, reduces the ability of the eye to see contrast. Because it is normally more difficult to see after dark under artificial light, the loss of vision from sun glare has its most serious effects at night."

The ophthalmologist pointed out that the real problem is that most people suffer from "glare-fatigue" without knowing it. After being outdoors all day in the bright sun, a motorist's 32 candlepower headlights seem only as effective as 5 or 3 candlepower, equal to the strength of ordinary flashlights. The motorist believes this reduction in illumination is due to the fact that the night is extra dark and does not know the fault is in himself. This means he may see pedestrians or traffic hazards too late to avoid a serious accident.

Dimmed Vision

"While a person with normal night vision might be able to drive a car at 60 miles per hour and see an obstacle in time to stop his car," said Tillyer, "a person whose night vision had been reduced by the after-effects of daytime sun glare might not be able to see the obstacle and stop in time unless he was traveling only 40 miles an hour. Put this significant difference out on a major thruway where whole lines of drivers are clipping along at 50 to 60 and it is obvious that a number of people are dangerously overdriving their headlights." He said that research studies show that after a day in the sun 50 percent of all motorists may require nearly twice as much light as usual to see normally with their headlights.

In a study of accident experiences for eighteen months on the Pennsylvania Turnpike, it was found that the vast majority of accidents involved driving errors. Of this majority 8.2 percent were the result of misperception, misjudging distance, overdriving lights and fog.

Here's a simple experiment to illustrate loss of night vision: stare out of a window at a bright object for a minute. Now look back at a white object in a dark corner of the room. The white object will appear grey and dim at first and only takes on its normal brightness after a few minutes. The longer you look out the window, the longer it takes to recover your normal vision in the dark corner of the room.

Last year 40,000 Americans were killed in traffic accidents. Some 1,400,000 were injured, including 100,000 permanently disabled. While many studies of the causes of these accidents have been made, none have been fully conclusive. The Sun Glass Institute believes there are enough incidents where sun glare has been a contributory factor to accidents to demonstrate the importance of sunglasses to highway safety.

EFFECTS OF SUN GLARE
ON NIGHT DRIVING VISION
Required Stopping Distance at 50 M.P.H., 192 feet
STOP
UNEXPOSED DRIVERS (No Loss of Night Vision)
192 Feet
STOP
EXPOSED DRIVERS (Severe Loss of Night Vision)
95 Feet
97 Feet
Source: Dr. R. H. Peckham before Highway Research Board

BEAT THE HEAT!
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It's common knowledge that excessive perspiration causes loss of body salts which in turn slows down the normal body processes. This causes workers to lose pep and energy and production decreases.

To restore this lost salt, install Hav-aLift Salt Tablets in disposable dispensers. Hav-aLift is the most effective and economical method of replacing Salt and they dissolve evenly over a regulated period thus eliminating nausea and the bitter salt taste.

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CATALOG NUMBER 569-Q7

(Use Key # F-14 on Inquiry Card on page 1)

inside the trade

Richard DeStefano has been named by *MINNEAPOLIS-HONEYWELL REGULATOR CO.* to direct nationwide sales of the company's proximity switches, marketed through the sales organization of the firm's *MICRO SWITCH* division. DeStefano formerly was east central manager for the division.

H. K. PORTER COMPANY, INC. has announced acquisition of *Federal Wire & Cable Company, Ltd.*, Guelph, Ontario. Acquisition of Canada's fourth largest wire and cable concern was made by *H. K. Porter Company (Canada) Ltd.*, a wholly-owned Porter subsidiary.

Harold F. Nunn, Vice President and General Manager of Porter's Canadian organization, will move his headquarters from Toronto to Guelph to supervise the new operation. He will continue to supervise Porter's other Canadian business, the Henry Disston Division, and sales representation for several Porter divisions in the United States.

J. Godfrey Smith, founder and president of Federal, will retire. His son, *Thomas G. Smith*, has been named Federal's General Sales Manager.

U. S. FIRE PROTECTION ENGINEERING SERVICE, INC., a consulting engineering firm in the fire prevention and fire protection field, announces the establishment of a San Francisco office. Mr. Paul D. Smith, formerly chief engineer of Johnson and Higgins of California, is the manager of the new office. The office is located in the Sheldon Building, 461 Market Street. Other offices of the firm are located in Kansas City and Chicago.

Two new appointments in the *Safety Products Division of MINE SAFETY APPLIANCES COMPANY*, Pittsburgh, have been announced by *Eugene W. Merry*, vice president of the company's industrial products group. *K. L. Steele* was named manager of manufacturing and *D. N. Wise* manager of engineering.

Mr. Merry has also announced the establishment of a *Technical Products Division*. The new division is responsible for engineering, manufacturing and sales of process control and other instruments, space filters and ventilation equipment, liquid oxygen converters and velocity power tools and accessories. *H. B. Stafford* is operations manager of the new division and *N. W. Hartz* is sales manager.

Two appointments in the *Mining Division* have also been announced by *C. M. Donahue*, vice president.

E. M. White, formerly assistant manager of the mining department, has been named sales manager of the Mining Division and *W. C. Hamilton*, formerly section supervisor of the general engineering department, was appointed mining operations manager.

Following the sudden death of *Norman H. McRae*, the board of directors of *MULTI-CLEAN PRODUCTS, INC.*, St. Paul, Minnesota, has announced election of new officers. *E. V. Coulter*, formerly vice-president, was elected president and general manager, replacing McRae. Other new officers elected were: *E. C. Hesli*, vice-president and general sales manager and *William E. Westerdahl*, secretary. *C. A. Halverson* was re-elected treasurer.

E. V. Coulter, new President, and the late Norman H. McRae were co-founders of the company which manufactures floor maintenance machines and products.

H. H. SCOTT, INC. of Cambridge, Mass. is currently building a new 32,000-square-foot plant at Maynard, Mass. The building will be of unique contemporary design and will be an industrial showplace.

The new building will be completed around the beginning of September for the manufacture of noise analysis equipment and high fidelity components.

S. G. Paddock, Vice-President of *BURGESS-MANNING CO.*, has announced the appointment of *W. A. Carroll, Jr.* as General Sales Manager of the Industrial Silencer Division. Mr. Carroll has served as New York District Manager of the Company for several years. His new office is essentially a part of the expansion program of Burgess-Manning Co., and he will headquarter in the Dallas office, assuming the sales responsibilities which were previously under the direction of Mr. Paddock.

Also announced is the promotion of *R. T. Oliver, Jr.*, of the New York office

to District Sales Manager to replace Mr. Carroll. Mr. Oliver will be supported by *John R. Parsons* who recently joined the Burgess-Manning organization in New York.

The election of *Robert R. Porter* as president of *KEASBEY & MATTISON CO.* has been announced by the board of directors of the company. He succeeds *Ernest Muehleck* who has reached the age of retirement. Associated with activities of the company for the past two years, Porter was elected executive vice president in March 1956.

W. J. Spencer has been appointed Assistant Sales Manager of *Pyrene-C-O-Two Division* of the *FYR FYTER COMPANY*, *William E. Tromanhauser*, Vice President and General Sales Manager, has announced. Mr. Spencer will have headquarters in Newark and assist in the direction of the national sales force of Pyrene-C-O-Two, manufacturer of a complete line of fire protection equipment.

He has been with the Company for 10 years and previously had been on the sales staff of A. Gross & Co. in Baltimore.

THE BLACK & DECKER MFG. CO. announces the opening of a new factory service and sales branch in Washington, D. C. Located at 2353 Rhode Island Avenue, N. E., it will serve Black & Decker users in Washington, and also in the adjacent areas of Maryland, Virginia, and West Virginia.

Factory-trained service personnel will man the new branch, which is equipped with a complete stock of replacement parts for the company's line of portable electric tools. *Wm. W. Adams*, formerly a repairman in the Baltimore branch, has been appointed Branch Service Manager of the Washington Branch, which is under the over-all supervision of *R. A. Wernsdorfer*, Northeastern Regional Service Manager.

Morgan C. Plummer of St. Louis has been appointed to the newly-created position of supervisor of Pydraul sales for *MONSANTO CHEMICAL COMPANY'S Organic Chemicals Division.*

Plummer has been sales engineer in the functional fluids section of the division's petroleum chemicals sales group since May, 1955.

McQUAY, INC., manufacturers of heating, air conditioning and refrigeration equipment, has entered the prefabricated chimney field, it was announced by *Roy J. Resch*, president.

The new branch of the company will be headed by *Paul C. Van Alstyne*, formerly general manager of the Van-Packer Corp., Bettendorf, Iowa, also makers of prefabricated chimneys. The McQuay chimney has been manufactured in Canada for a number of years by Keep Rite Products, Brantford, Ontario, with whom McQuay has entered into a working agreement whereby McQuay will manufacture the chimney in this country and Keep Rite will in turn market certain McQuay products in Canada.

Mr. C. B. Miller has retired as Vice President and member of the Board of Directors of *"AUTOMATIC" SPRINKLER CORPORATION OF AMERICA*, it was announced by *J. A. Coakley, Jr.*, President of the company. Mr. Miller will continue as a consultant to the company.

Mr. Miller has been with "Automatic" Sprinkler continuously since 1926. He has been a member of the Board of Directors since 1938, and was elected a Vice President on April 7, 1945.

Prior to his election as a Vice President, Mr. Miller was General Manager of the company's Installation Division, with full responsibility for the engineering and construction activities of the company. Recognized as a leading fire protection engineer, Mr. Miller has made great contributions to the advancement of the use of automatic sprinkler systems. He has served actively on committees of the National Fire Protection Association and the National Automatic Sprinkler and Fire Control Association.

Mr. B. F. McDonald, President of the *B. F. McDONALD CO.*, Los Angeles, has announced the election of *Mr. Charles W. Punton* as Executive Vice President of the company. Mr. Punton has had over twenty-five years' experience in the safety equipment industry, coming to the B. F. McDonald Company from the Mine Safety Appliances Company where he was Director of Engineering.

SUGAR BEET PRODUCTS CO., Saginaw, Michigan, manufacturers of industrial skin cleansers, has just completed a new factory for its Canadian Subsidiary, *Chemical By-Products, Ltd.*, at 23 Racine Road, Rexdale, Ontario.

The new production facility comprises 33,000 square feet of floor space and is situated on a six acre site to allow room for future expansion. Chemical By-Products, Ltd. started its Canadian production in 1947. Previously skin cleansers were supplied from the United States operation which began in 1909. The new building will also be Canadian Headquarters for the *Bradley Container Corp.* of Maynard, Mass., a subsidiary of the *American Can Co.*, for whom Chemical By-Products Ltd. is exclusive Canadian Sales Representative.

The new structure is steel and brick, with the latest type sprinkler system to assure maximum fireproofing. Both processing and warehouse areas have floors of a new metallic-surfaced concrete to provide a durable, sure-footed surface which permits static electricity to harmlessly flow off into the ground.

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Locks **AUTOMATICALLY & instantly-holds**

Prevents death and injuries from falling.

Automatic: Positive. Will catch workman if he starts to fall even if unconscious.

Inexpensive. Easy to Install. No upkeep. Clamps to any rung ladders, peg ladders, pole or frame. No welding or cutting.

Simple to operate: Requires no attention from climber.

Notched rail **hot dipped galvanized.** Entire equipment rust and corrosion proof.

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what's new for JULY

REFLECTIVE ARMBANDS

(Use Key # 880 on Inquiry Card on page 1)

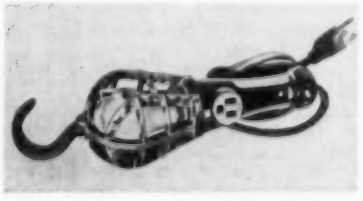
ARMBANDS made of reflectorized Scotchlite fabric have been introduced by the Olympic Glove Co., Inc. Intended to make the wearer visible at night to approaching vehicles, the armband's reflected brilliance is said to be as much as 235 times as bright as white paint. The company claims that light rays are reflected directly back to their source, regardless of the angle the light rays make with the Scotchlite.

Designated Glo-patch, the elastic armbands slip easily onto the arm. Under average conditions, they can be seen by oncoming motorists at 750 feet (1500 feet under ideal conditions). The armbands are suitable for use by utility, railroad, construction and oil field workers, for plant guards, for pedestrians and for all who work outdoors at night. The Glo-patch measures 3 x 6 inches and is available in brilliant silver or red. A smaller Glo-patch to fit over the palm of the hand (for police use in controlling traffic) is also available.

HAZARDOUS LOCATION EXTENSION LIGHTS

(Use Key # 881 on Inquiry Card on page 1)

SAFETY around hazardous locations is offered with a new series of grounded, completely insulated portable service lights made by McGill Mfg. Co., Inc., Electrical Div. The No. 5999 series of portable lights features a rugged, macerated canvas molded cage and a molded phenolic handle which has no exposed metal. Freedom from short circuits around switchboards and other open-wiring locations is said to be assured



with the new portables. One of four basic models, the No. 5999-RGH is equipped with 25 feet of red thermoplastic cord, a molded plug, reflector and a reinforced, fibre swivel hook.

Molded into the impact-resistant phenolic handle is an approved, 3-wire convenience outlet which provides grounded power for tools without the use of additional extension cords. The new series is recommended for service where protection against short-circuiting is vital, such as switchboards, panelboards, power and broadcasting stations and signal offices.

NEW ALUMINUM GRATING

(Use Key # 882 on Inquiry Card on page 1)

A NEW aluminum grating designed to provide versatile usage and durability has been announced by the Klemp Metal Grating Corp. Known as the Rectangular Riveted (RR) aluminum grating, it is said to retain the combined advantages of a rectangular opening and riveted gratings. The grating remains structurally rigid regardless of cutouts located in any part of the panel, the company claims.

Type RR grating is reported to clean easily and offer great durability under severe load conditions. It features a 79 percent clear opening with its rectangular design, so that the possibility of dirt, oil or scum accumulating in corners is greatly reduced. Of aluminum construction, it will not rust, and requires only light maintenance. The grating, which has a wide variety of applications, has met U. S. Navy specifications for design and strength and is being installed on naval vessels.

LIGHTWEIGHT FIRE HOSE

(Use Key # 883 on Inquiry Card on page 1)

GOODALL Rubber Co. has introduced its new lightweight Fire-Flex cotton and dacron fire-hose with a reinforced rubber lining. The hose is said to be lighter in weight, more flexible and yet stronger than conventional fire-hose. A 100-foot length of the new hose in 1½ inch inside diameter weighs less than 19 pounds compared with approximately 20 pounds for a 50-foot length of conventional hose.

In addition to such conventional use as municipal fire-hose and as rack-hose for the protection of buildings, the Fire-Flex hose can be dropped from helicopters for use in fighting forest fires and can be used for oil exploration and for plant protection in oil refineries, chemical plants, etc. The hose has been approved by both the Underwriters' Laboratories and the Factory Mutual Laboratories.

BACK-PACK RESUSCITATOR

(Use Key # 884 on Inquiry Card on page 1)

A LIGHTWEIGHT resuscitator which can be carried on the back has been developed by the National Gas Cylinder Co. The company reports it can cut precious seconds from the time required to administer oxygen to victims of gas poisoning, suffocation, heart failure, shock, drowning and many other types of mishaps.

The resuscitator weighs about 20 pounds with its two "D" oxygen cylinders. It can be quickly fastened to the back and is held in place by strong elastic bands. Since the rescuer has the unit snugly strapped on his back, he can crawl com-

fortably and has both hands free for moving debris or giving emergency treatment. It is equipped with a "Handy" control which adjusts the flow of oxygen to the lung capacity of any patient, automatically inhaling and exhaling for him until his own breathing is restored. A twist of one dial then converts the unit to an inhalator to provide 100 per cent oxygen. It can also be used as an aspirator to suck obstructing material from the throat. In areas of air contamination such as mine or sewer disaster, chemical explosion, smoke or dust, the unit can be equipped with oxygen masks for both the victim and the rescuer. Use of strap-on masks makes it possible for the victim to be given oxygen even while he is being carried on a stretcher. In such cases, the back pack could be worn by one of the stretcher carriers. The unit can also be supplied with extra tubing (up to 200 feet) so the lightweight mask can be lowered to a victim whom emergency crews cannot reach immediately.

GIANT WIRE ROPE SLING

(Use Key # 885 on Inquiry Card on page 1)

A NEW GIANT in wire rope slings, 3 inches in diameter and furnished with the patented Dualoc Ending, has been introduced by the Wire Rope Divisions, American Chain & Cable Co., Inc. The manufacturer recommends its use to fill a vital need in today's expanding materials handling programs for moving heavy power generating, industrial, marine and

railroad transportation equipment. The Dualoc ending eliminates tucking, crushing or distortion of the sling body; therefore no strength is lost in the splice. Collars are applied merely to hold the wire ending in position. Full holding power is developed by the wire rope strands of the dead end binding around and against the live end in the wrapped section.

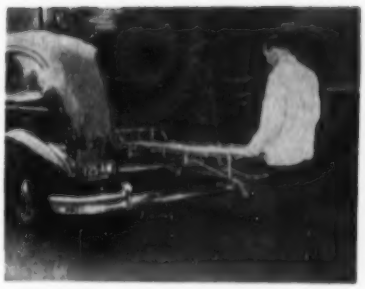
Fabricated from 3 inch diameter 6 x 37 preformed improved plow steel wire rope, the sling's breaking strength is rated at 720,000 pounds with a safe working load of 144,000 pounds or 72 tons. The sling assembly is proof tested to 288,000 pounds, double the safe working load.

ACID REPELLENT CLOTHING TREATMENT

(Use Key # 886 on Inquiry Card on page 1)

NEIRAD Industries, Inc., has introduced an emulsion formulated to protect the wearer of cotton work clothes against splashed acids and caustics. Known as Neiradex, the emulsion is rinsed into the clothing as a final step during routine laundering and lasts undiminished until the garment is next laundered.

According to the company, the product acts to raise the surface tension of the cotton fibers. Because of this, splashed fluids of all kind roll off harmlessly. The pores of the fabric remain open, however, allowing the clothing to "breath," assuring bodily comfort to the wearer. The treatment can be applied to dynel work clothes as well.



NEW AMBULANCE COT

(Use Key # 887 on Inquiry Card on page 1)

THE FERNO Mfg. Co. has announced a new ambulance cot which can be handled by a single attendant. Known as the "One Man" cot, it rides approximately 31 inches off the floor on a four-wheel undercarriage. At this height, transfer of a patient from bed to cot, and from cot to bed is a relatively simple, one man operation.

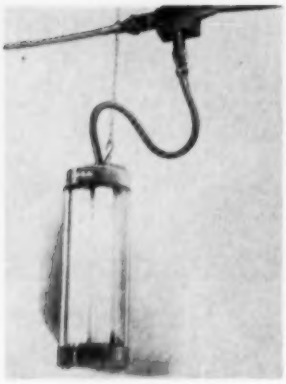
When the cot is to be placed in the ambulance, it does not have to be lifted off the ground. Instead, it is merely pushed into the vehicle and rides in on two large wheels mounted immediately below and at the front of the cot. As the four-wheel undercarriage strikes the rear of the vehicle, it retracts flat against the bottom of the cot. When the cot is removed from the ambulance, the undercarriage automatically swings down again, locking in place. Since lifting the cot is never necessary, the patient is never jarred or made fearful of being dropped. Other features of the cot include a foot rest, adjustable backrest and hinged side rails.

MINE LIGHTING SYSTEMS

(Use Key # 888 on Inquiry Card on page 1)

WHAT ARE said to be the first safe systems for illuminating underground working areas has been developed by Mine Safety Appliances Co. Before the development of the MSA systems, the only approved mine lighting was the familiar miner's cap lamp powered by small storage batteries. Designated as the M.S.A. Permissible Mine Lighting Systems, they include flourescent mine lamp fixtures, cables, cable connectors and distribution panels with circuit breakers. The new systems do not eliminate the need for individual cap lamps, but provide supplementary illumination, principally at the working face, to make operations safer and more efficient, the company claims. All components which are used in other than fresh air intakes have been tested and approved by the Bureau of Mines.

The company further states that use of the new systems should also result in reduced loss of material and supplies, less abuse of equipment, better housekeeping, improved supervision, less worker fatigue and better morale. One variation consists of an unground, isolated 2-pole circuit (2-conductor cable), while the other consists of a grounded three-



pole circuit (3-conductor cable). Key to both systems is the fluorescent lamp fixture (see inset). This lamp is designed to provide dependable illumination with instant start circuits that are proven safe under any and all conditions of ventilation in gassy mines. Its lightness of weight and compact size make it suitable for portable service in all working sections. The fixture, developed for durability and practicality, can not cause an explosion even if broken in an explosive mixture of methane and oxygen. The systems operate on a 60-cycle, 118-volt single phase supply. When 440 or 220 volts is provided underground, a transformer is used to step down the voltage. This also provides the isolated circuit for the underground system.

RADAR DETECTION UNIT

(Use Key # 889 on Inquiry Card on page 1)

RADAR-EYE is a motion detection instrument introduced by the Radar-Eye Corp. to protect industrial and commercial business against vandalism, burglary or intrusion. Radar is employed to detect any movement within an operating radius of 25 feet in any direction from the antenna. Invisible radar waves, sensitive to any movement, instantly turn on floodlights and then set off a screaming siren. Intruders cannot crawl over it, slide under it, cut through it or in any way tamper with either the unit or wiring system without setting off the alarm. The alarm operates as long as motion continues and for one minute thereafter. Radar-Eye automatically shuts off and resets itself, ready to alarm again at any further movement or new intrusion.

A portable unit, the detector may be installed anywhere desired even behind non-metallic walls. A fire detection circuit and alarm may be connected to the unit. It uses less current than a 60 watt bulb. It measures 17¼" long, 10⅞" deep and 25¾" high including the antenna and operates on 115V. Ac, 60 c.p.s. single phase. Remote control key switch permits control from a distance or outside premises.

ESCAPE & LOWERING DEVICE

(Use Key # 890 on Inquiry Card on page 1)

AN ESCAPE device for use in a number of emergencies features safe, dependable automatic operation, the Davy Automatic Fire Escape Co. reports. The device is

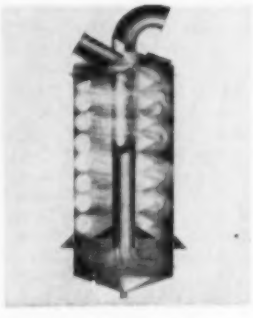
designed to lower a person automatically from elevated positions such as building windows, platforms, rooftops, etc., and consists of a feed drum, lowering line and harness. It may also be used for simple exits from elevated working positions on structural frames, bridges, etc.

The device lowers the user at a safe, constant rate of speed, its automatic brake compensating for weight differences in persons using the device. It is available in portable or fixed models, and the supplied cable length is based upon individual needs.

DUST & FUME FOG-FILTER

(Use Key # 891 on Inquiry Card on page 1)

THE R. C. MAHON CO. has introduced its Fog-Filter for dust and fume control, designed to remove air contaminants of less than 10 microns in size. As described by the company, the unit has no moving parts, but employs high pressure water fog in wetting airborne contaminants. Wetted down, the contaminants are forced down



to and out a drain to a collection bin or to a sewer. The Fog-Filter has an air resistance of only 2" w.g., and is not subject to fire hazard.

The unit is said to separate readily adhesive dusts and abrasive particles from the air. After cleaning, the air is channelled back into the atmosphere.

LIQUID COMBUSTIBLES INCINERATOR

(Use Key # 892 on Inquiry Card on page 1)

A NEW industrial incinerator for smokeless disposal of combustible liquid waste materials has been made available by Prenco Products, Inc. Designated the Model SF-1 smoke-free industrial incinerator, the new unit is designed to handle liquid paint sludges, thinners, oils, solvents and any other combustible wastes that can be rendered to a liquid or slurry form. It is adaptable to any viscosity range between air-setting waxy compounds and gasoline.

The incinerator provides full combustion at temperatures in excess of 3000° F. with no ash in either the retort chamber or effluvia. The high operating temperature contributes to rapid burning rate and high efficiency. The new unit is an up-fired retort design, providing inherent explosion relief characteristics through the top. Following initial start of the unit, operation is continuous and automatic and does not require operator attention. The combined over-all height of base and retort is approximately 10 feet. Outside

retort diameter is 30 inches. Total weight is approximately 4500 lb., including refractory. The unit is rated at 1,900,000 BTU/hour. The burner itself utilizes an air-jet principle requiring a supply of compressed air which is used both for atomization of the liquid waste fuel and for combustion. The burner is equipped with automatic "fail-safe" electronic shut down equipment.

NYLON SAFETY STRAPS

(Use Key # 893 on Inquiry Card on page 1)

THE USE OF spun nylon webbing has been announced by the Miller Equipment Co., Inc., for its new line of safety straps for linemen. This solid woven material, double-impregnated, has good dielectric qualities and features an inner lining which acts as an automatic signal indicating when "pole wear" calls for strap replacement.

Tests conducted on the nylon straps

(featuring a single tongue buckle) showed that on a straight pull the buckle hole yields at approximately 1550 lbs. When tested as used on a pole, the buckle hole yielded at 3450 lbs. Cross section breaking strength was recorded at approximately 5500 lbs. The nylon webbing is available in all stock sizes, and is identified with a suffix "N" added to the strap length required.

VEHICLE WARNING LIGHT

(Use Key # 894 on Inquiry Card on page 1)

TO FURTHER promote highway safety and prevent accidents involving parked vehicles, U-C-Lite Mfg. Co. has marketed

a new plug-in type flashing light called Big Beam Car Flash. It mounts securely on any flat, smooth surface of an auto or other convenient object with a suction cup and plugs into cigarette lighter receiver with a ten-foot cord. It flashes 72 times per minute and will operate overnight without running down battery.

The light is visible at great distances, the company reports, the distance being determined by mounting location and color of lens used. Lens is available in red, green, amber, blue or clear, made of molded plastic. For use with either 6 or 12 volt systems, Model C-6 for 6 volt and Model C-12 for 12 volt batteries. Small size of the light makes it convenient to store in glove or tire compartment.

METAL REPAIRS MATERIAL

(Use Key # 895 on Inquiry Card on page 1)

UNITED Laboratories, Inc., has introduced a thermo-setting plastic for repairing dents, holes, scratches and breaks in metals. Known as Certified Metaplastic, it adheres strongly to iron, steel, aluminum, wood, glass and most plastics. It is said

to be unaffected by acids, alkalis, solvents, oils, heat or cold.

The repair material is supplied in two packages consisting of a resin paste and a hardener. These are mixed in equal parts by volume and applied with a spatula or similar tool. Applied cold, it will air dry overnight. A heat lamp is recommended to expedite drying. The product is said to have no toxic effects on the user.

NEW PLASTIC GLOVES

(Use Key # 896 on Inquiry Card on page 1)

COMPAR Plastic has been used to produce one of the newer members of the Wil-Gard industrial glove line of the Wilson Rubber Co. Sturdy and long-wearing, Wil-Gard Compar Plastic gloves not only protect the hands from skin infection, but also guard valuable precision equipment from corrosion caused by perspiration and body acids. They are free from sulfur and will not tarnish metal parts. In addition, they feature high resistance to petroleum-base degreasing agents.

Easy to pull on or off, Compar Plastic Gloves won't stretch out of shape. Their comfortable curved-finger styling allows maximum finger flexibility for precision work. Available in standard and heavy duty weights, they are offered in sizes from 8 through 11 and in 10½, 14 and 18 inch lengths.

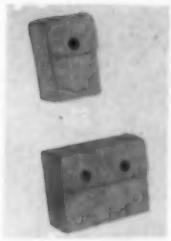
PORTABLE WELDING SHIELDS

(Use Key # 897 on Inquiry Card on page 1)

A NEW LINE of portable welding shields has been announced by Industrial Products Co. Designed to confine the

operation, and to protect near-by personnel from sparks, flash, flying chips and scale, the shields are self-supporting, flexible for forming to the requirements of the job and can be easily rolled up and carried.

The shields can be used for floor, bench, machine and overhead welding, for flame cutting, wire brushing, chipping and grinding. Durably constructed of flameproofed canvas over a wire mesh frame, they are available in a wide range of sizes.



SNAKE BITE KIT CASES

(Use Key # 898 on Inquiry Card on page 1)

FIELD workers operating alone in poisonous snake regions can be equipped with individual Saunders' snake bite kits and leather carrying cases manufactured by Medical Supply Co. The cases slip onto workers' belts and provide them with a convenient means of carrying immediate snake bite treatment.

The snake bite kits fit snugly into the cases, but can be easily and quickly slipped out by the worker in an emergency. A special venom-suction pump, constriction band, inhalants, iodine swabs and bandages are included in the kit. The leather cases are available in either single or double kit size. The double case makes it possible for the worker to carry a first aid kit, as well as the snake bite kit.

DRY CHEMICAL EXTINGUISHER

(Use Key # 899 on Inquiry Card on page 1)

A NEW dry chemical fire extinguisher said to equal the fire-killing power of four 1-qt. vaporizing liquid extinguishers has been made available by the American LaFrance Corp. Small in size (14½ inches high) and weighing only four pounds, the model PDC-2A features simple hand-squeeze operation. The company states that the dry chemical is harmless, non-toxic, non-corrosive and will not freeze in any climatic temperature.

The extinguisher is simple to service, the company claims. A pressure gauge on top indicates its readiness for operation since the gauge reading is always the same as the pressure within. Complete, easy-to-follow directions for recharging and pressurizing are on the label. Approved by Underwriters' Laboratories, the Model PDC-2A is suitable for use against Class "B" (flammable liquids) and Class "C" (electrical) fires.

BOWL CLEANER TABLETS

(Use Key # 900 on Inquiry Card on page 1)

HORIZON Industries has developed a toilet bowl cleaner in effervescent tablet form which stresses safety to both personnel and porcelain surfaces. Known as Bol-Tabs, and packaged in individual foil wrappers, they sanitize and deodorize, as well as remove toilet stains.

Placed in the bowl, the tablet dissolves rapidly to make an efficient cleaning solution. It is said to remove rust stains and lime deposits and, if used regularly, prevent the build-up of deposits within the bowl. Use of the measured-portion packages eliminates waste and spillage associated with other types of cleaners.

STEP & PLATFORM LADDER

(Use Key # 901 on Inquiry Card on page 1)

A COMBINATION step and platform ladder has been developed by the Louisville Ladder Co. The heavy service aluminum step ladder has the extra strength of the full three inch rails on both the back and front. Heavy duty cadmium plated steel hinges are provided at the top of the extruded aluminum side rails and rubber safety shoe pads on the bottom of the rails. Wide gussets are provided at the back and front of the bottom steps.

The 14 x 22 inch platform has an aluminum diamond tread flooring and is reinforced with 1½ x 1½ inch aluminum angles. Spreader braces hold the ladder in the open position, and the platform must be lifted to close the ladder. The ladder can be mounted from either side and crossed over to the opposite side. Top steps will serve as a work seat for prolonged jobs. Two standard sizes (5 foot and 7 foot) are available. Special sizes can be obtained on order.

PLASTIC SAFETY HAT

(Use Key # 902 on Inquiry Card on page 1)

DEVELOPMENT of a new, all-plastic safety hat said to surpass all standards of protection and to incorporate a number of additional advantages has been announced by General Textile Mills, Inc. Available in two models, the GenTex #105 brimmed hat and the GenTex #205 peaked cap, the new safety headgear is constructed with a new plastic shell.

In addition to exceeding all standard safety requirements for resistance to pressure, impact, combustion and voltage, the plastic shell withstands violent extremes in temperature, and is especially useful in zero and sub-zero climates. The new hat incorporates the GenTex suspension system, which provides comfort and protection and is readily washable in either commercial or home laundry machines.

HEAD & FACE PROTECTORS

(Use Key # 903 on Inquiry Card on page 1)

THE JOSEPH Buegeleisen Co. has announced its new Buco line of face shields and helmets designed to provide comfort and maximum protection for the industrial worker. The wearer is said to be afforded conventional hat comfort through a three-way, "Contour-Fit" adjustment which insures a perfect fit to every head shape and size.

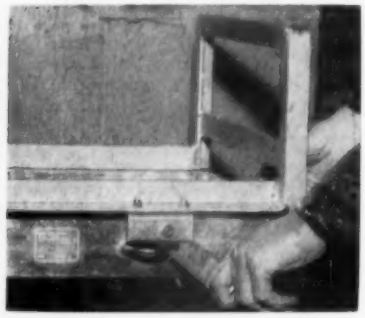
The helmets and face shields are offered in seven different headgear styles and eight window sizes. The company also has made available a liner for hard hats.

FOLDING TRUCK STAIR

(Use Key # 904 on Inquiry Card on page 1)

THE E. D. BULLARD Co. has announced an improved version of its Tacco Safety Stair, designed to reduce accidents associated with climbing into or out of the rear of trucks. The stair features a side latch which holds it in a closed position when not in use, even under extreme road shock conditions. Should the vehicle be backed accidentally into a loading dock, the stair, when extended, will slide automatically under the truck undamaged.

The stair weighing approximately 45 pounds, is 34 inches long by 14 inches wide. Its stair treads are designed to minimize slippage in wet and icy weather. It can be adapted for use on stake, or van, pick-up, and delivery trucks.



FLOOR RESURFACER

(Use Key # 905 on Inquiry Card on page 1)

A NEW FLOOR resurfacer, known as Floor-Nu, has been announced by the Steelcote Mfg. Co. The product is recommended for patching and resurfacing concrete, wood and metal floors, walls and tile grout subjected to the harmful effects of abrasion, acids, salts, solvents, alkalies or heavy traffic.

The resurfacer is available pre-mixed, ready for instant use. It can be feather-edged and will not shrink. According to the company, it is five times as strong as concrete. Fast drying, the resurfacer can be trucked over the morning after application.

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NOTE:

Your Safety News is designed to promote better employer-employee relations. Every item is carefully weighed from this viewpoint.

INSIDE PAGES
(pages 2 and 3)

So Goes the World
Lions & Machinery have Hungry Jaws
YOU DON'T HAVE TO TWIST ITS TAIL
NEVER REACH INTO MACHINERY WHILE IT IS RUNNING!
Guard Well
WANTED
from the CARELESS ACTS of others the WISE MAN corrects his own
SAFETY SHOES
WORK OVERTIME
Dress for Safety
SAFETY SHOES
FALLS
FALLS KILL 60 EVERY DAY

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Keeping the contents folksy, adding the grace note of humor, delivers your safety message with a nudge instead of a bludgeon. Your monthly chat gets enthusiasm instead of tolerance.

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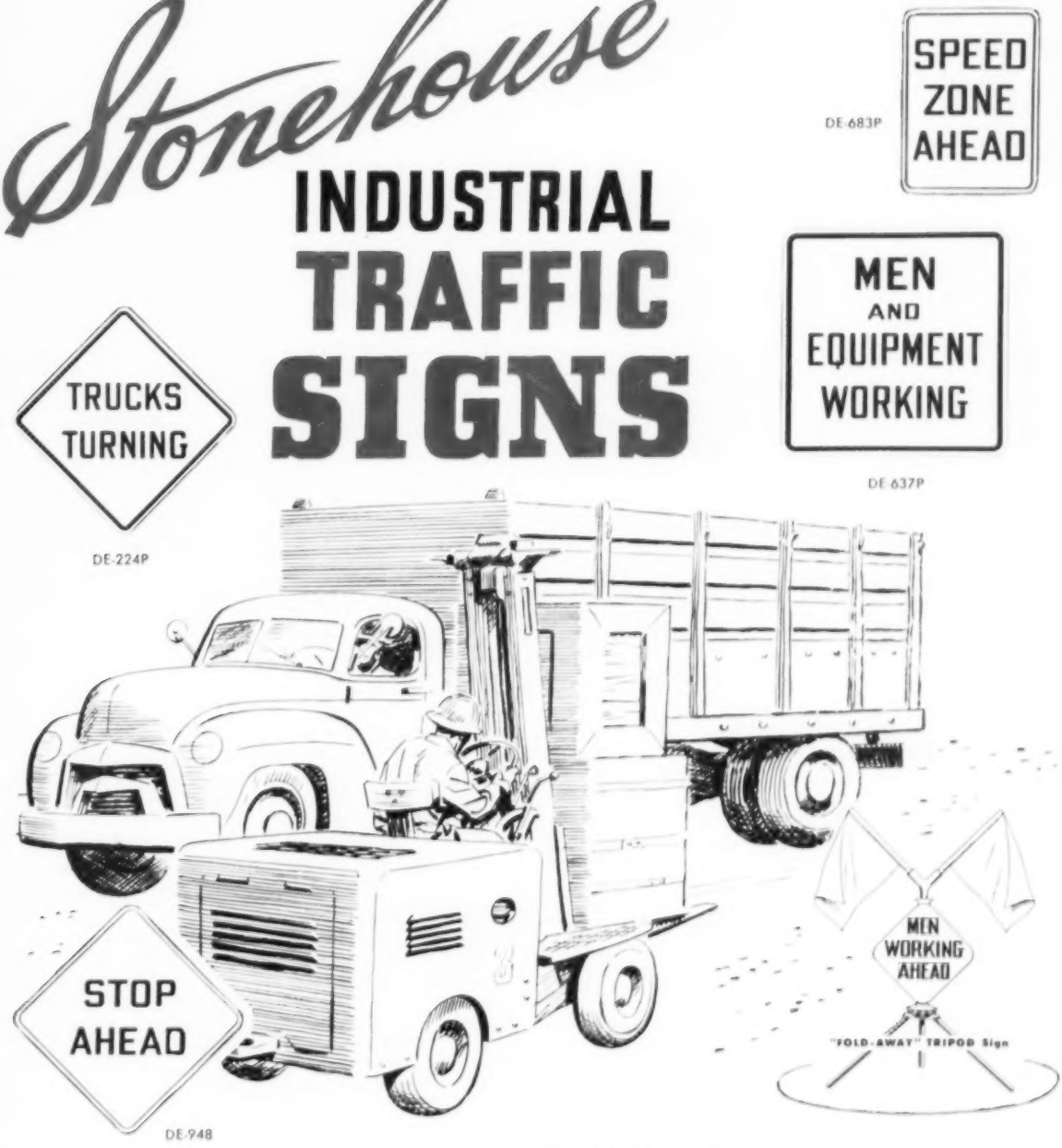

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(For details, use Key # F-25 on card on page 1)

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